

10

Overall Robotics Food Preparation Kitchen

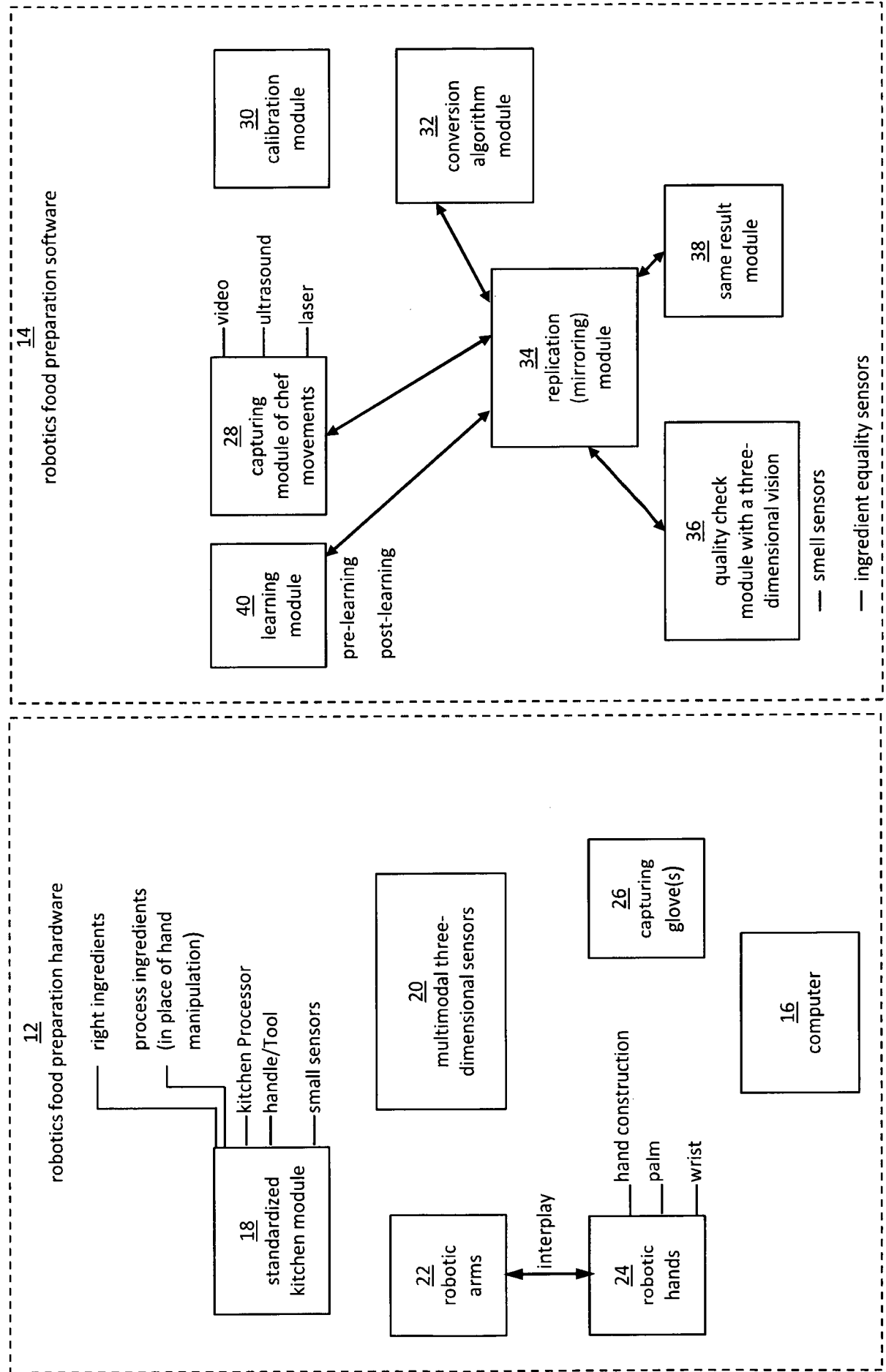


FIG. 1

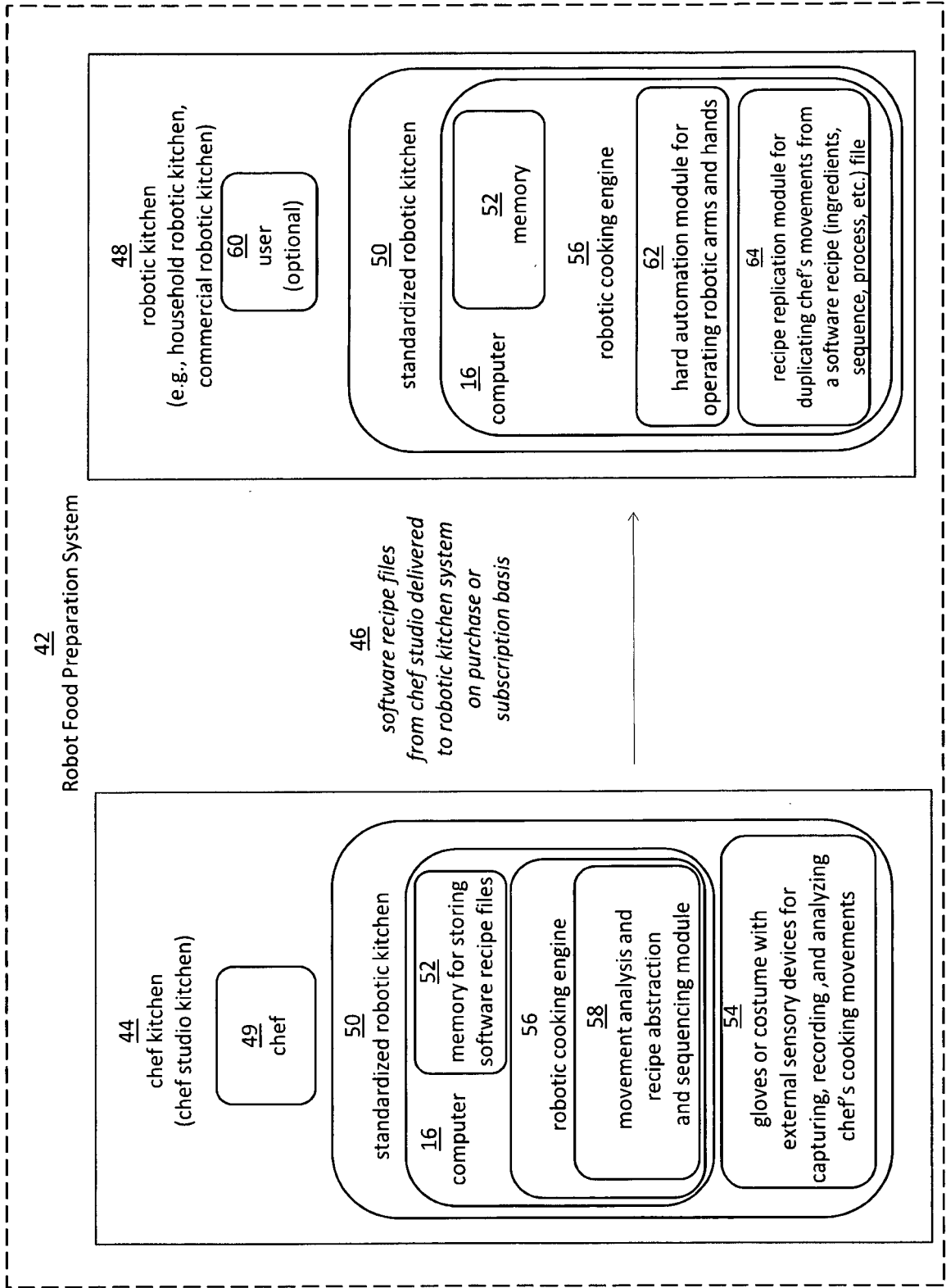


FIG. 2

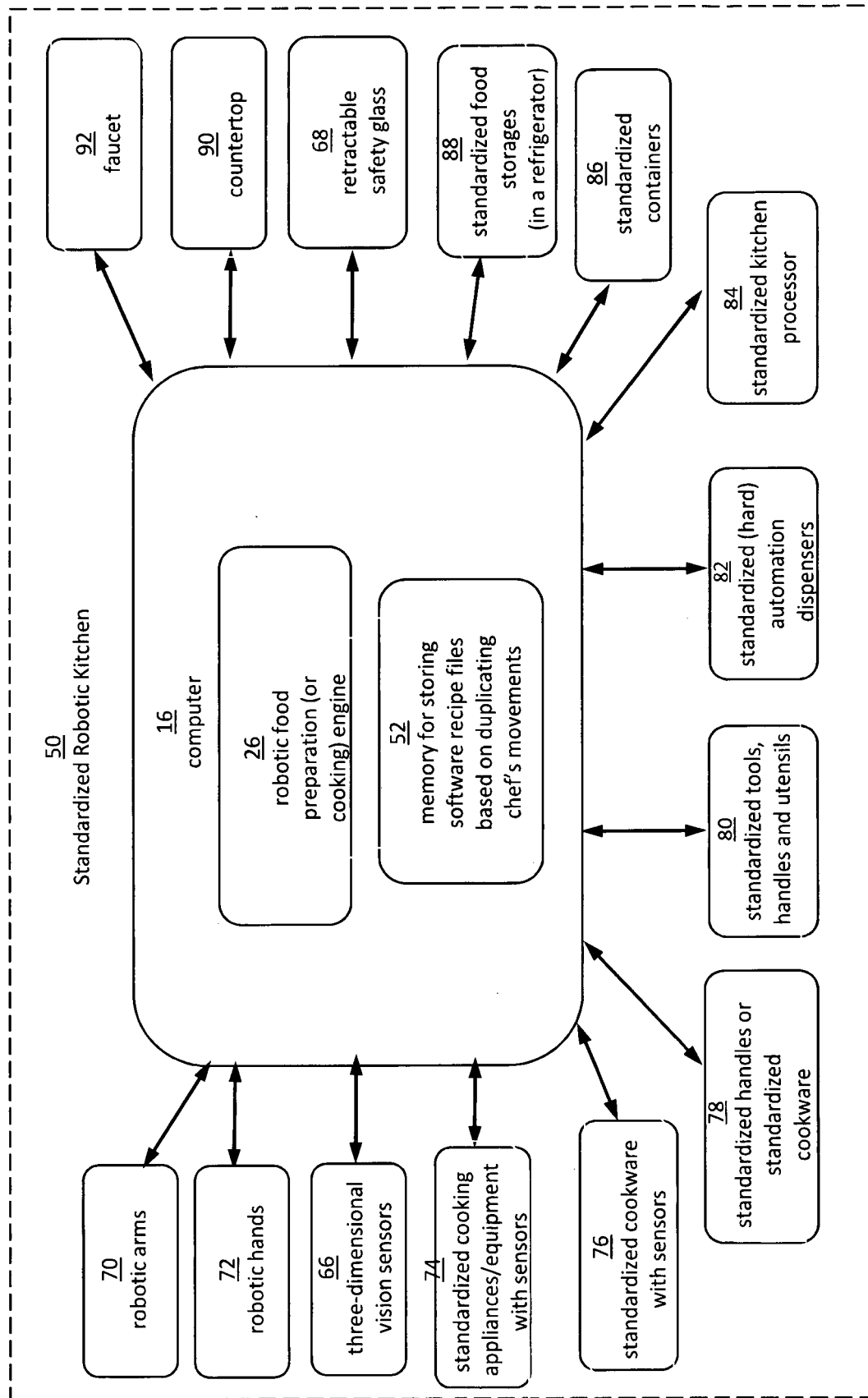


FIG. 3

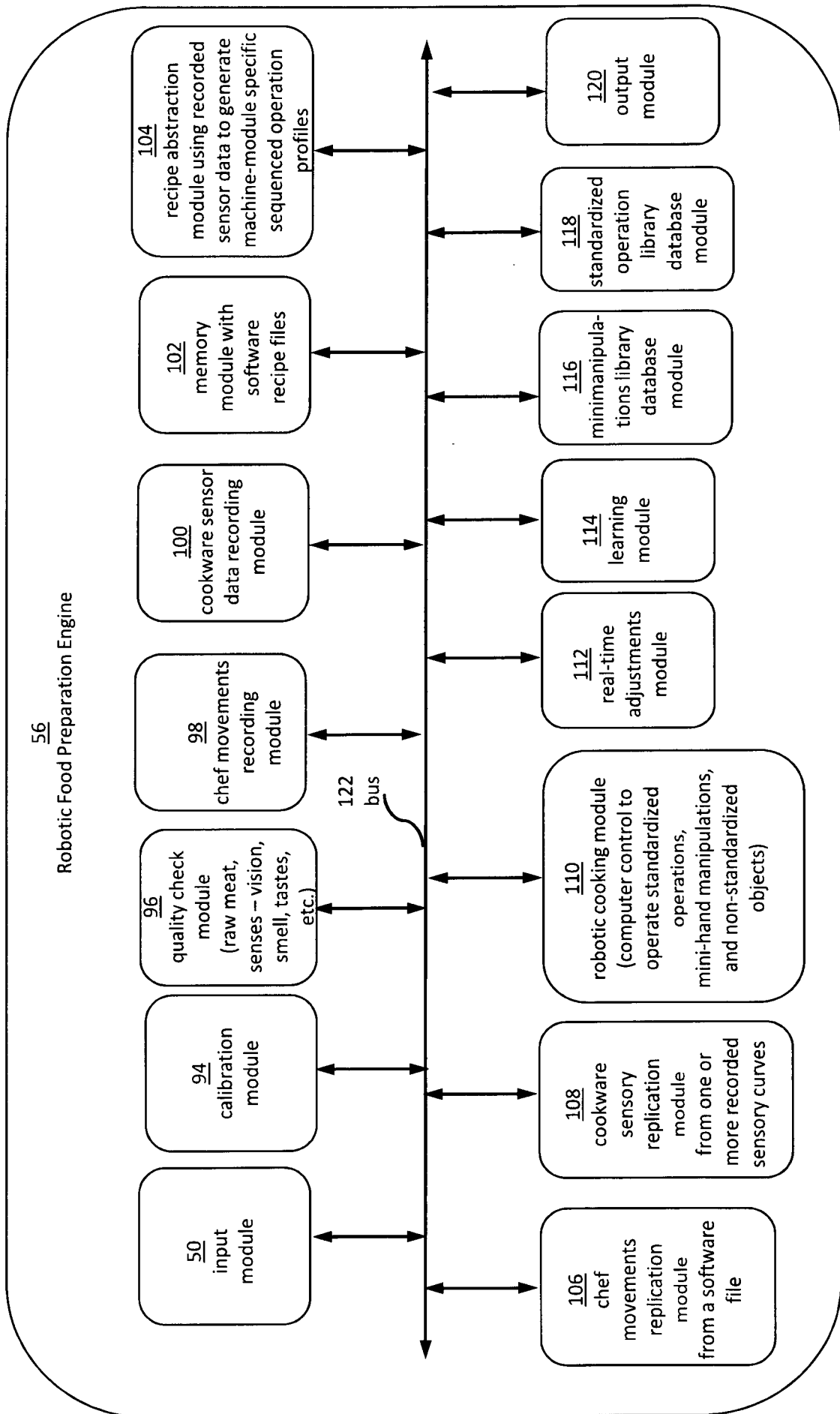


FIG. 4

124
Chef Studio Recipe-Creation Process

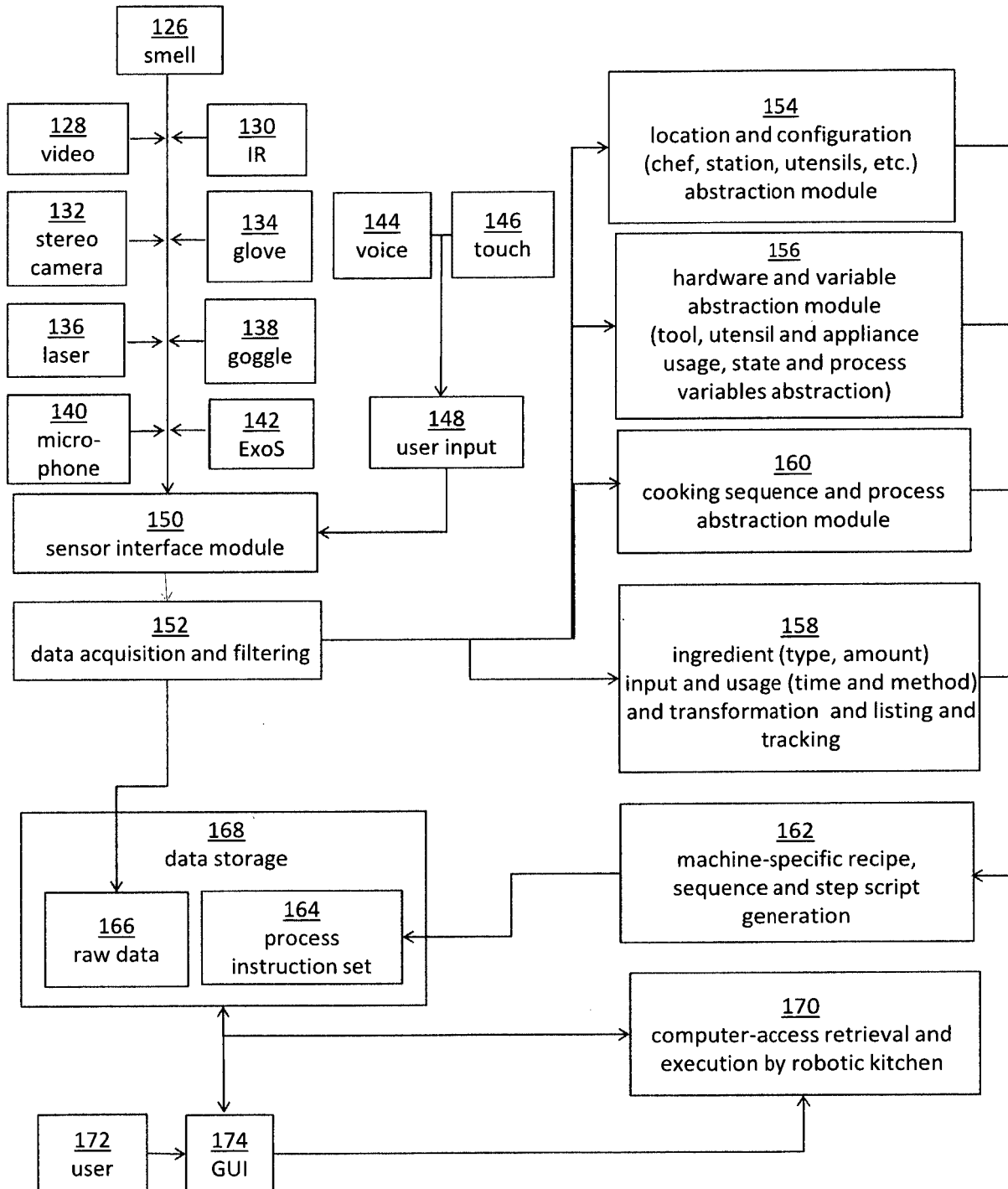


FIG. 5A

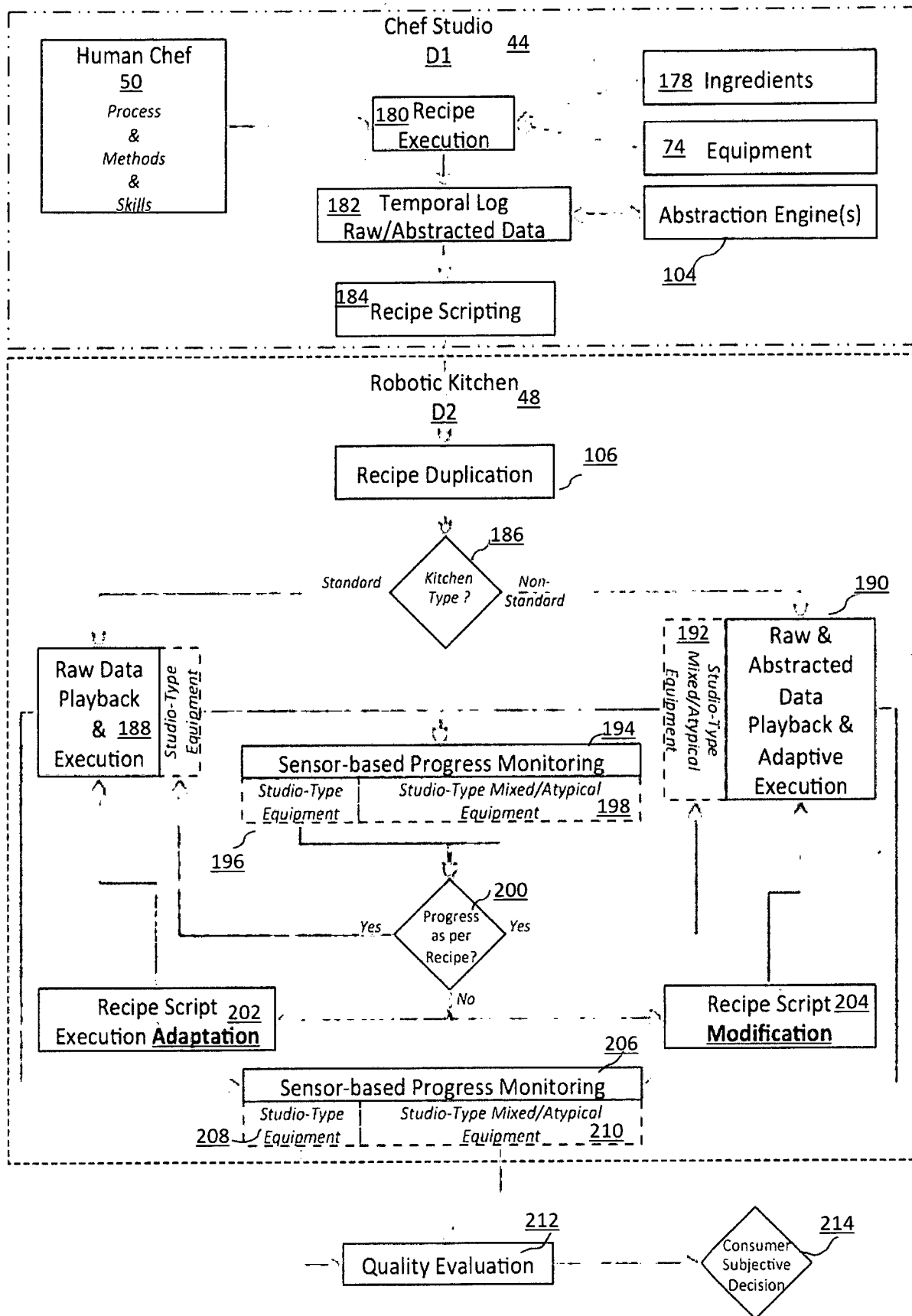
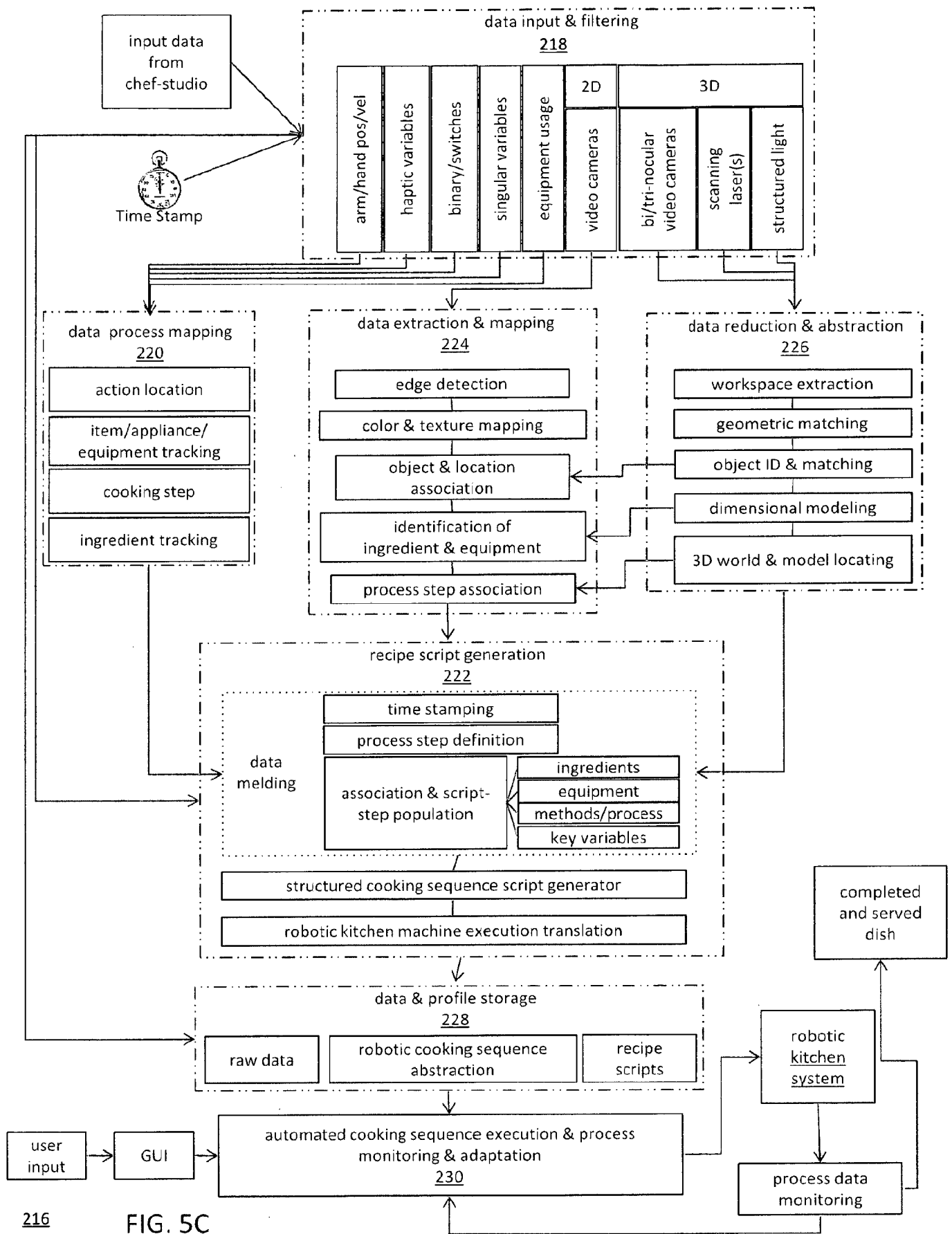


FIG. 5B



216

FIG. 5C

250
Software Object Handling/Manipulation by
Robotic-Kitchen Robot System - Structure & Flow

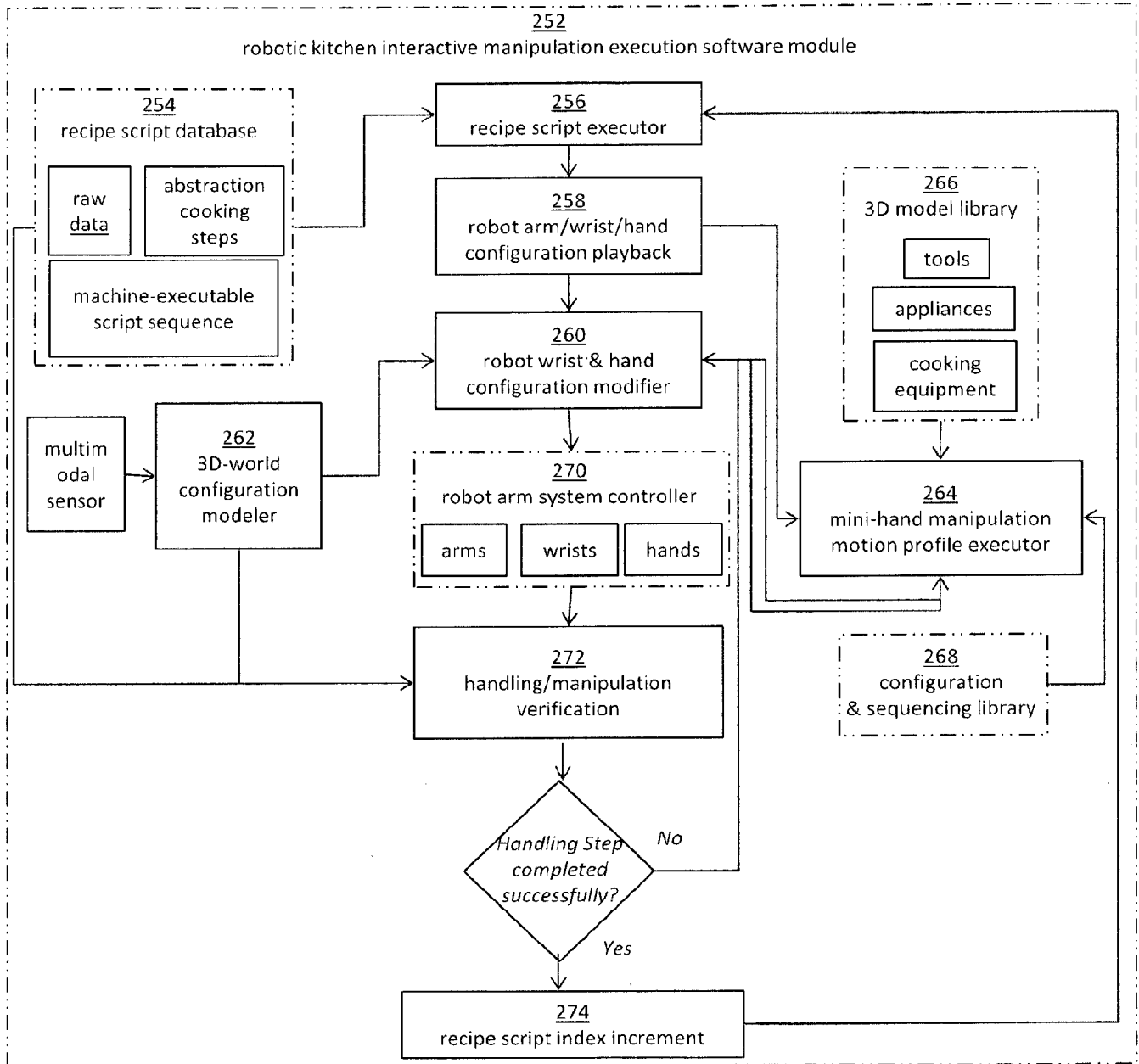


FIG. 5D

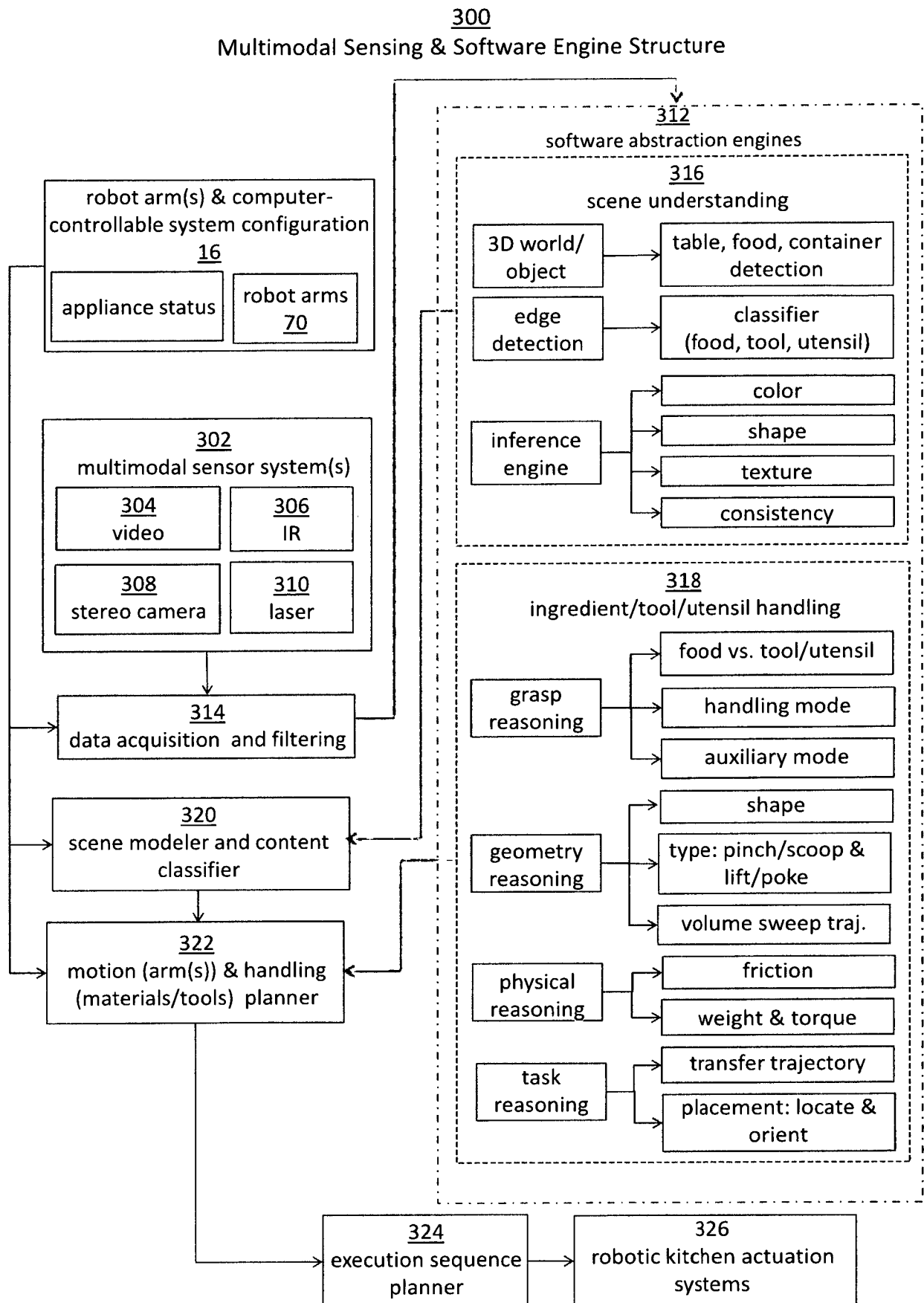


FIG. 6

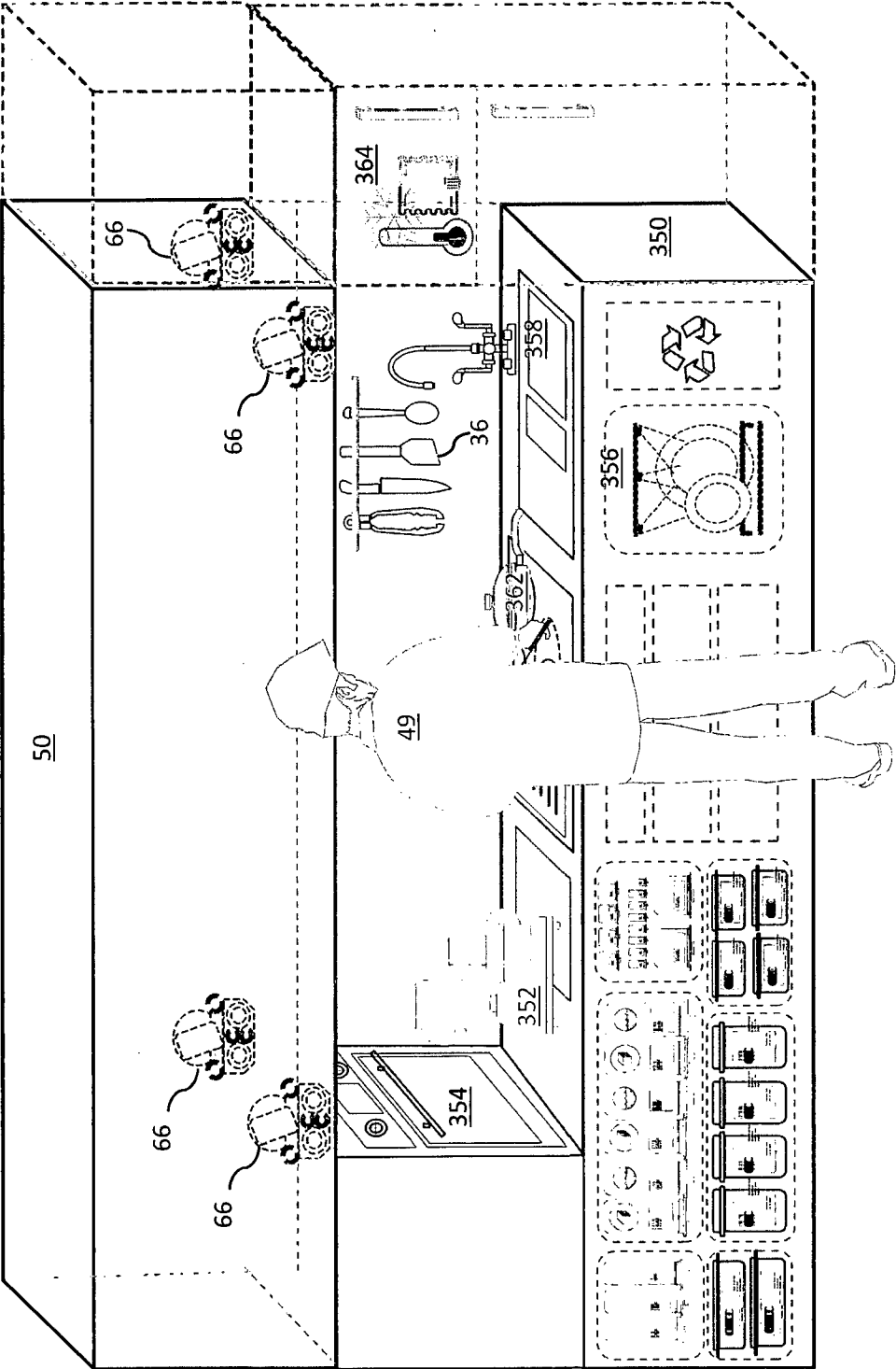


FIG. 7A

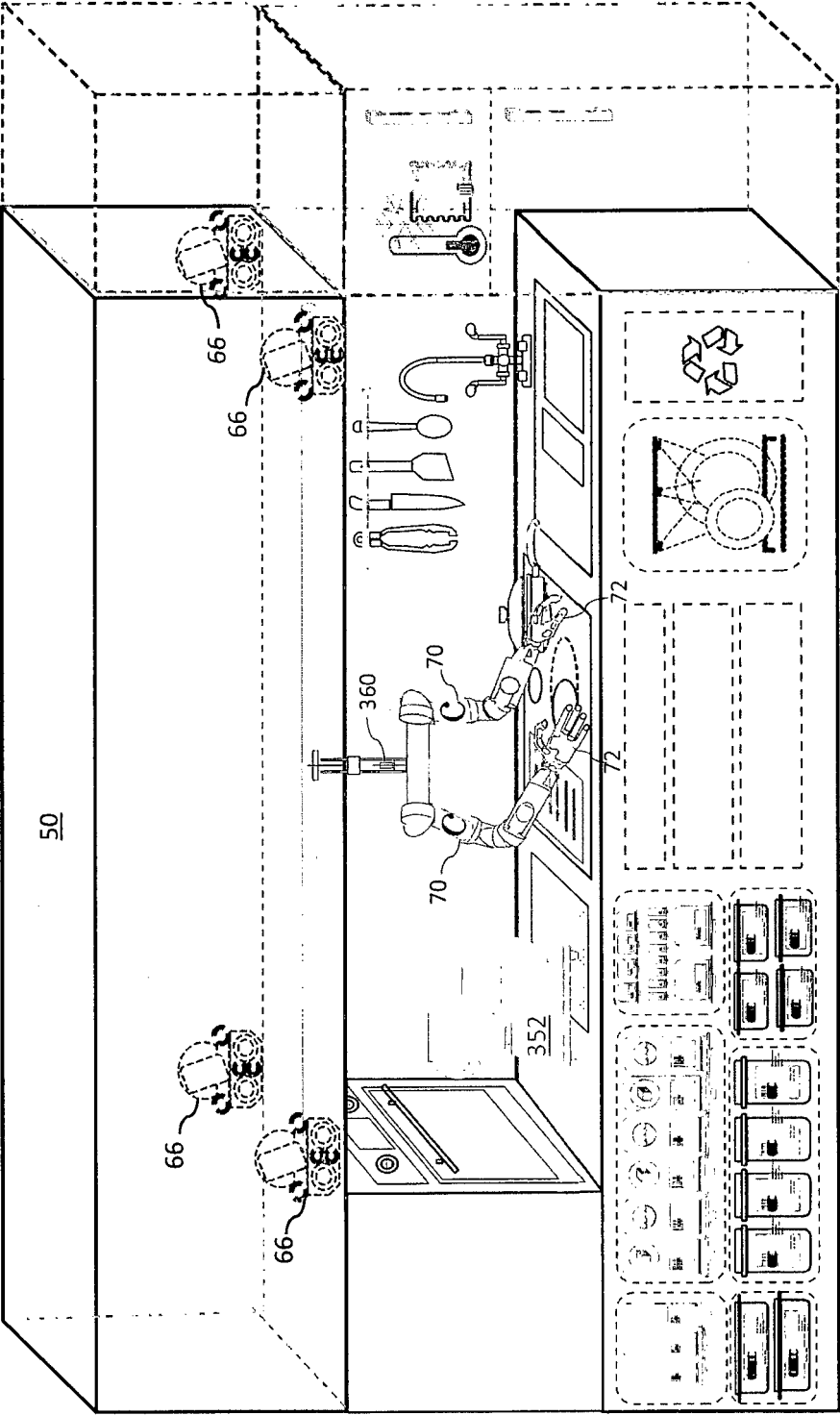


FIG. 7B

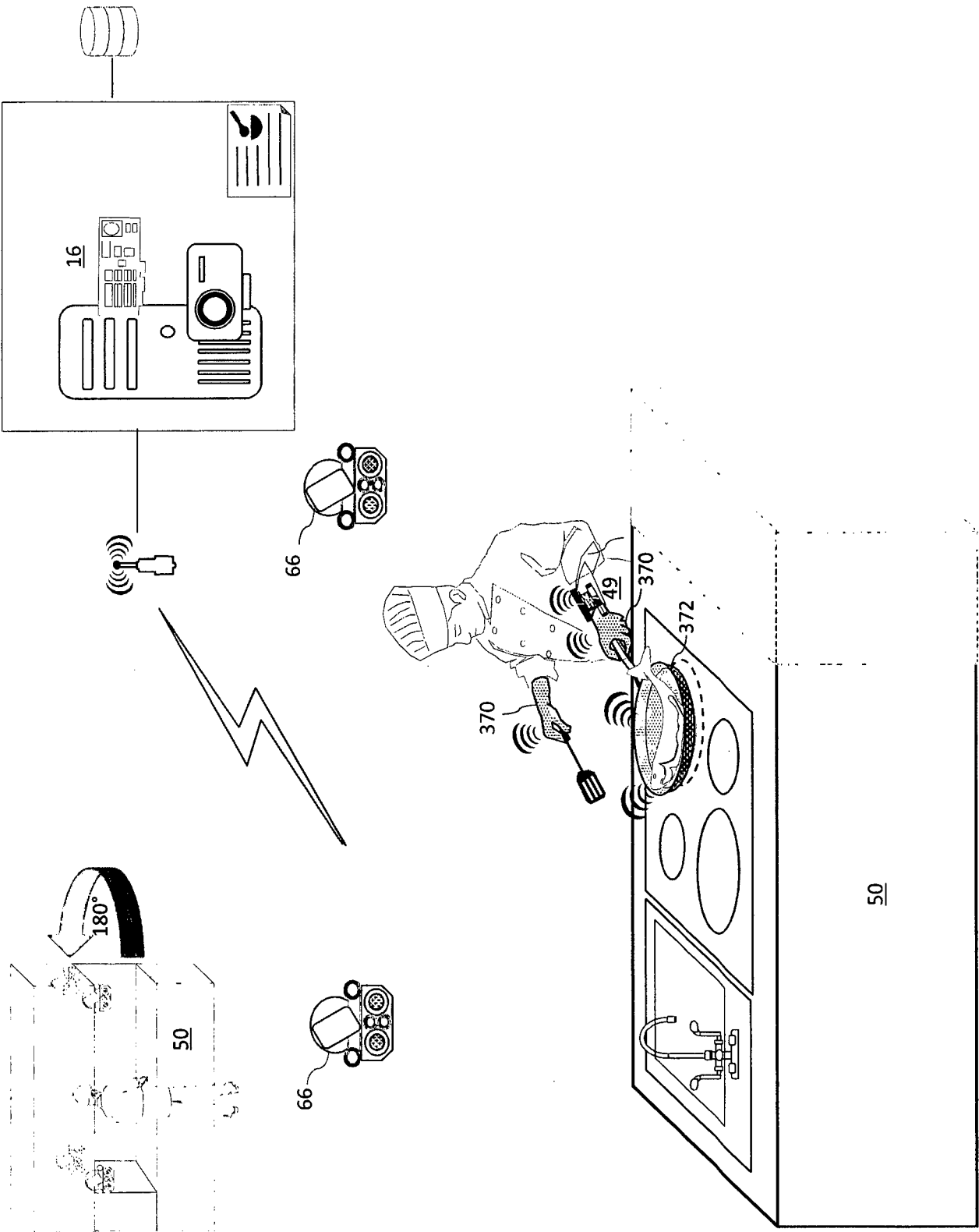


FIG. 7C

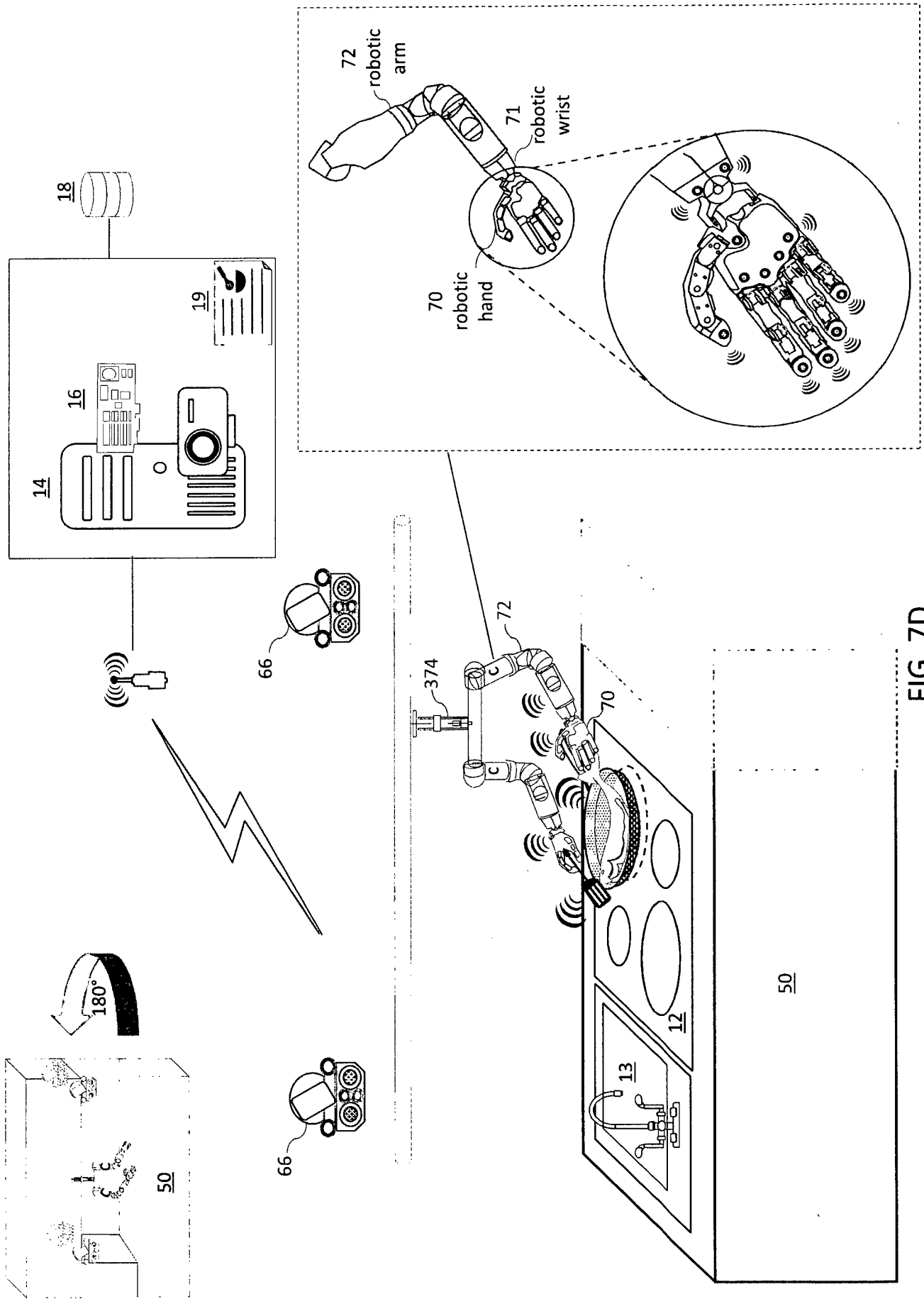
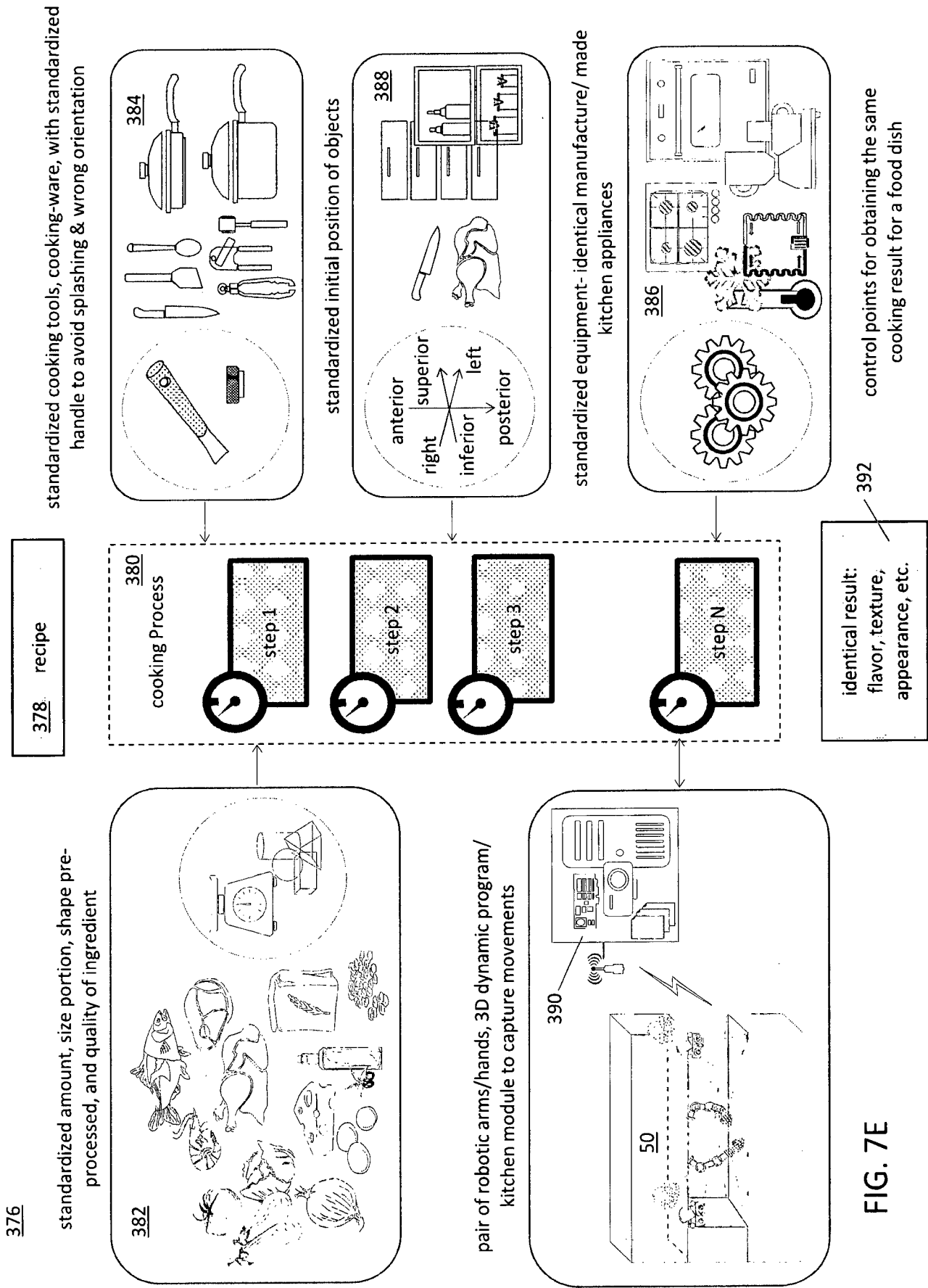


FIG. 7D



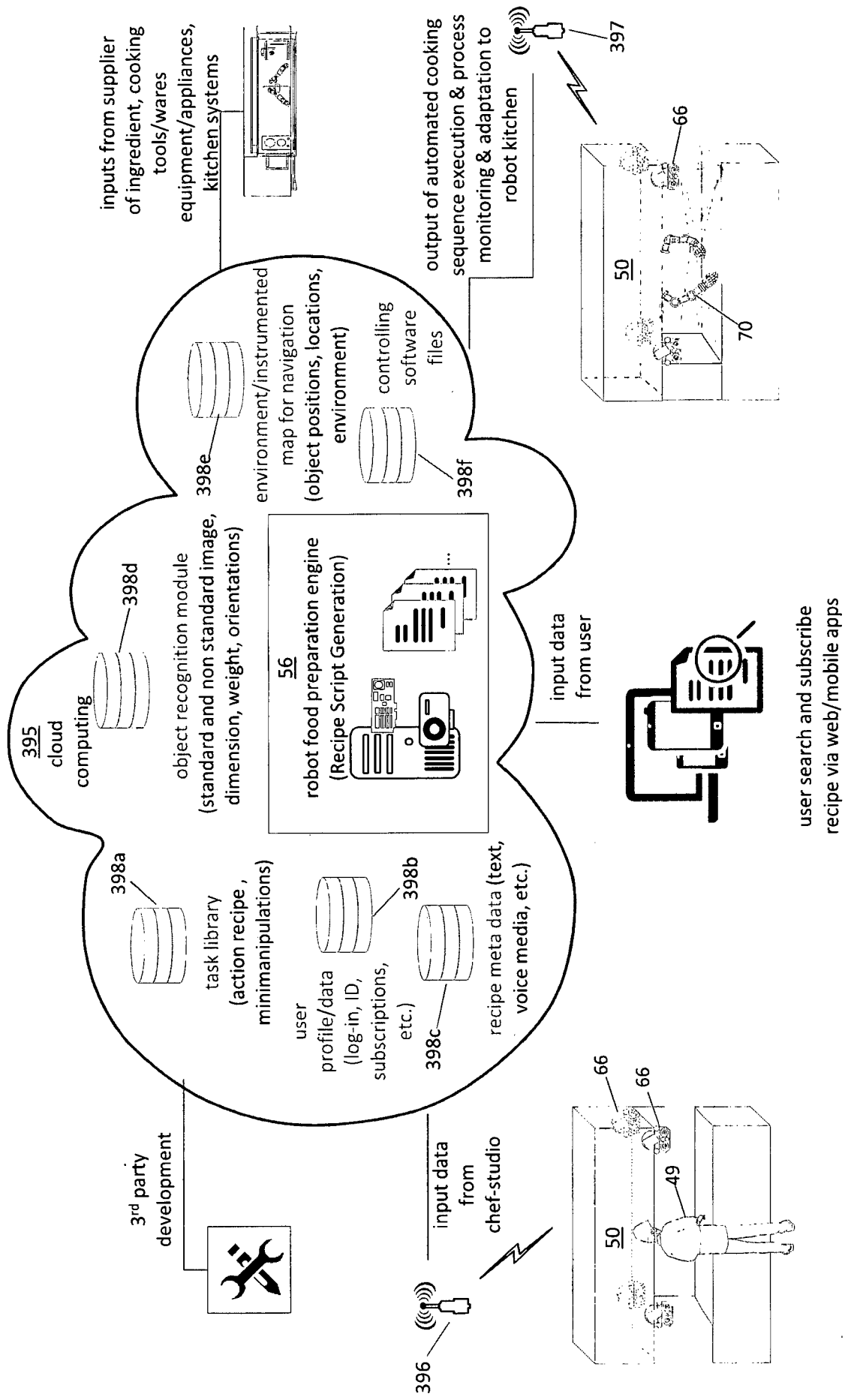


FIG. 7F

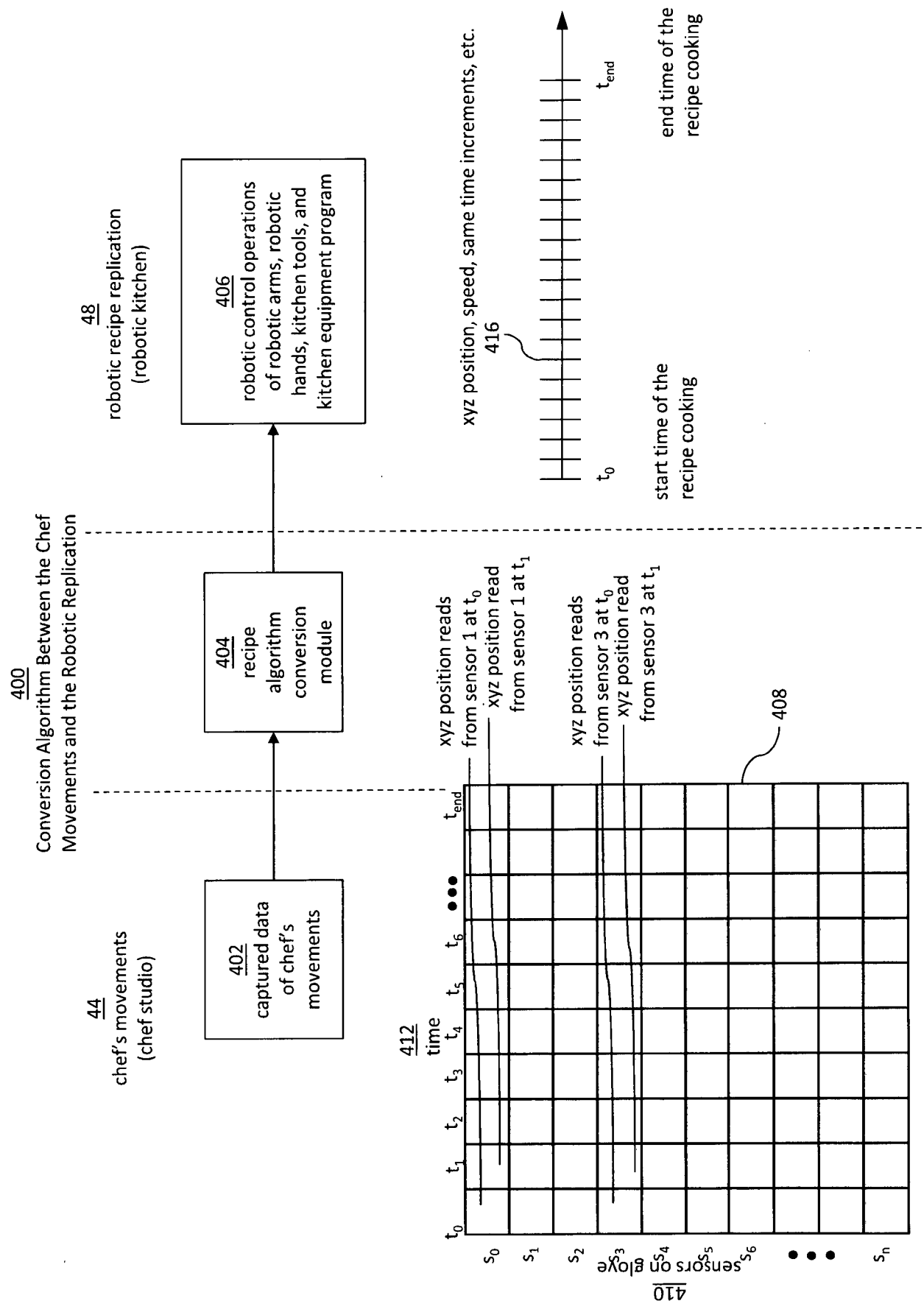


FIG. 8A

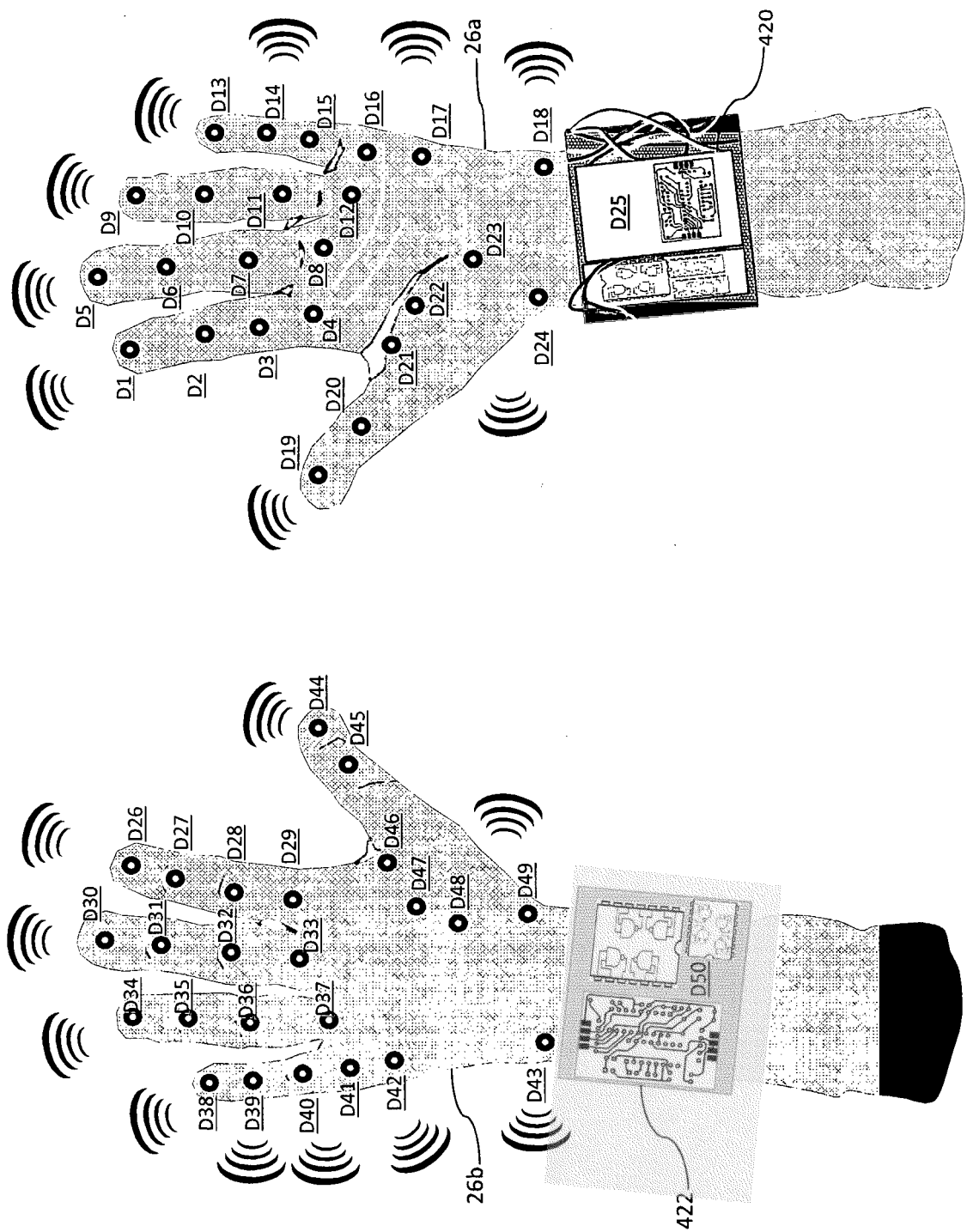
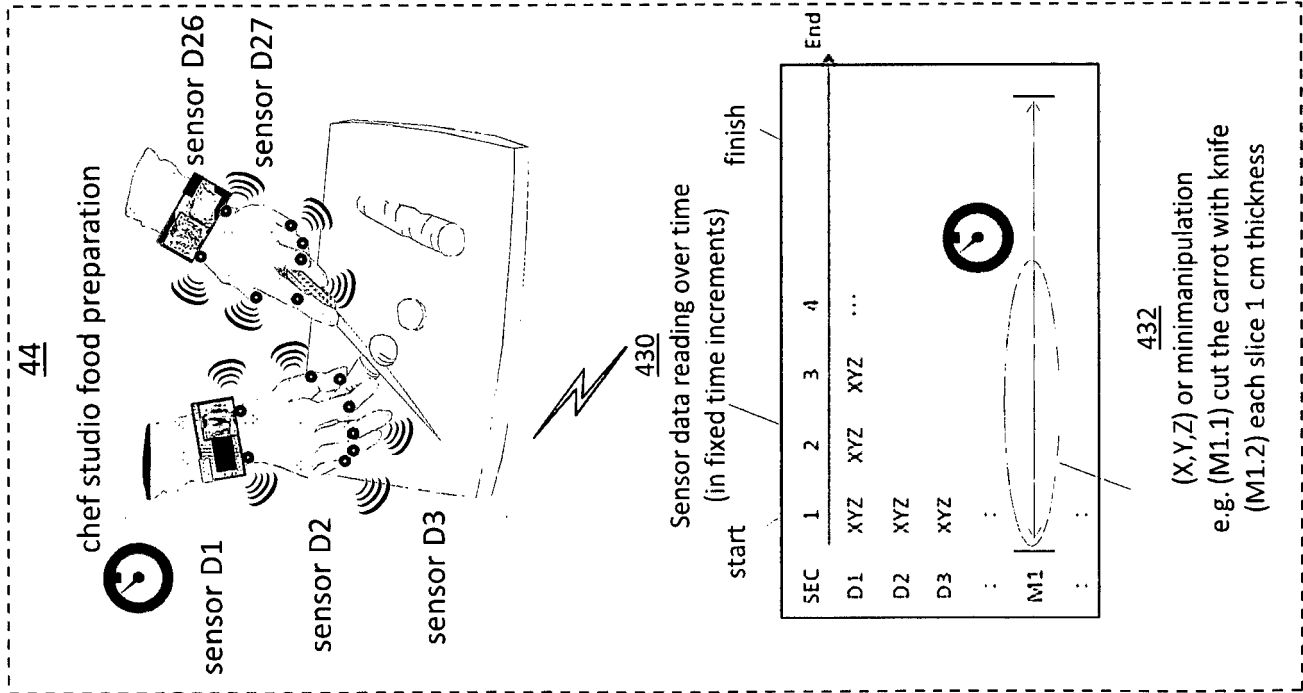


FIG. 8B



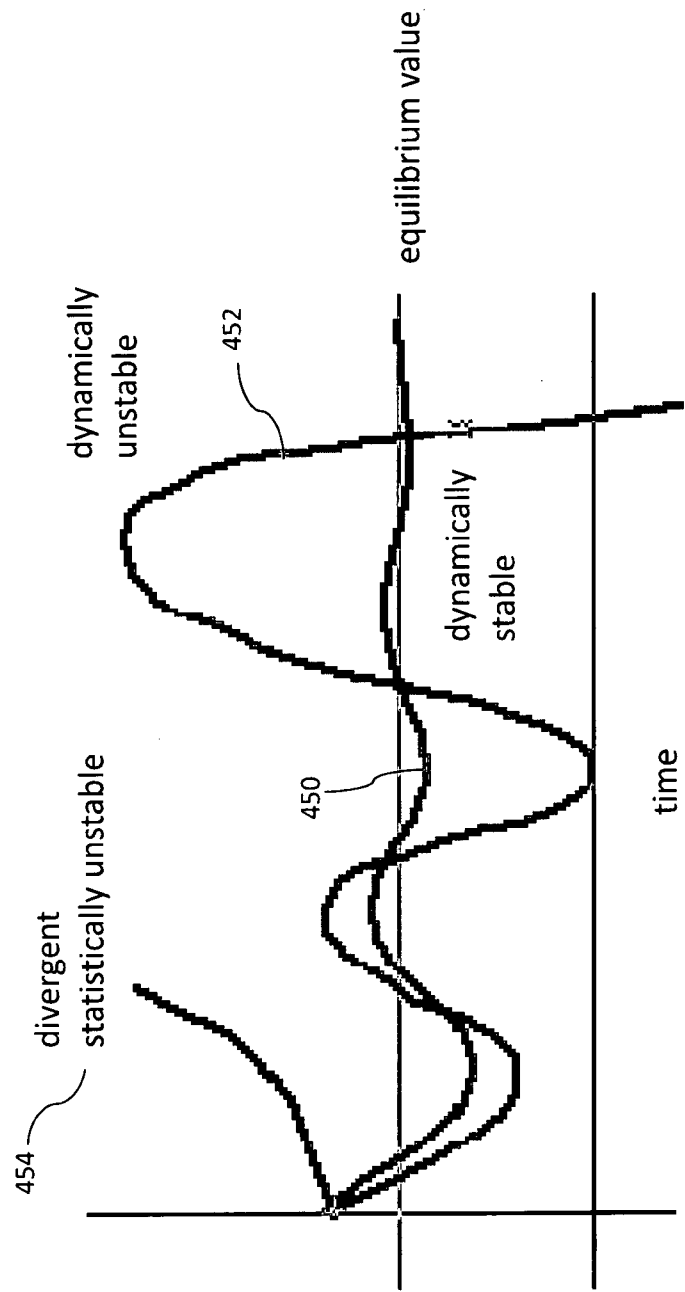
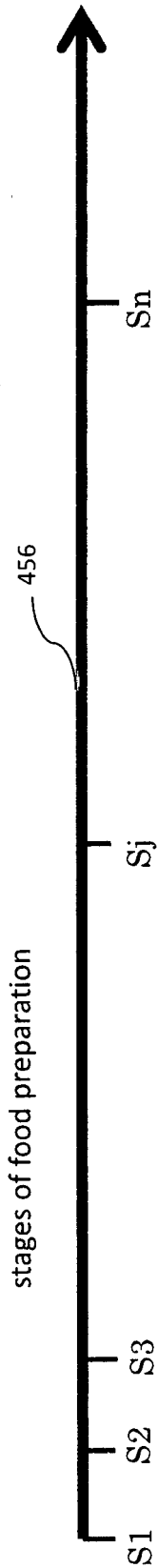


FIG. 8D



probability of success = product of the probabilities of success at all stages

probability of success at each stage = probability that any alternative works for that stage

$$P(S) = \prod_{S_i \in S} P(s_i | A(s_i))$$

$$P(s_i | A(s_i)) = 1 - \prod_{a_j \in A(s_i)} (1 - P(s_i | a_j))$$

FIG. 8E

Non-Standard	Standard
0.9	0.99
0.81	0.9801
0.729	0.970299
0.6561	0.96059601
0.59049	0.95099005
0.531441	0.941480149
0.4782969	0.932065348
0.43046721	0.922744694
0.387420489	0.913517247
0.34867844	0.904382075
0.313810596	0.895338254
0.282429536	0.886384872
0.254186583	0.877521023
0.228767925	0.868745813
0.205891132	0.860058355

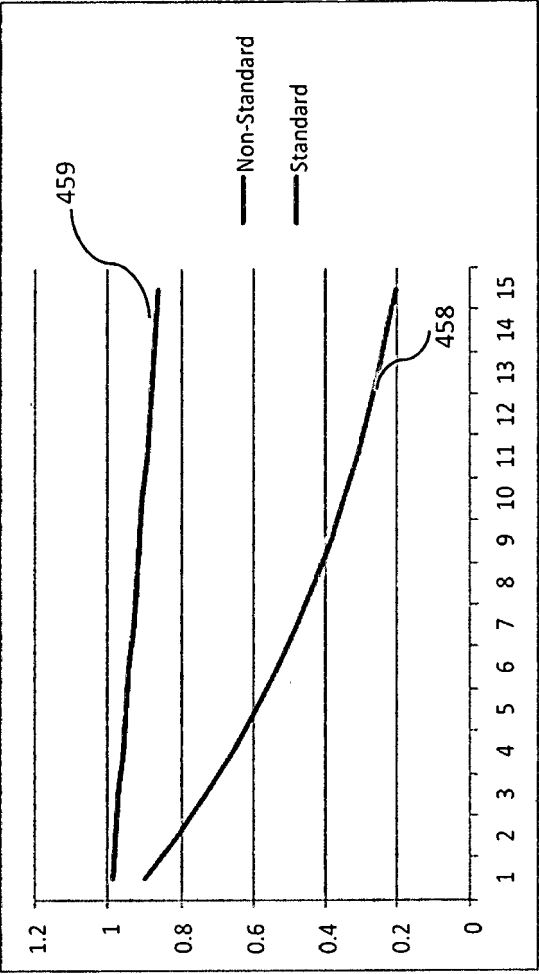


FIG. 8F

460

Recipe Execution of Minimanipulations in Multi-Stage Robotic Food Preparation

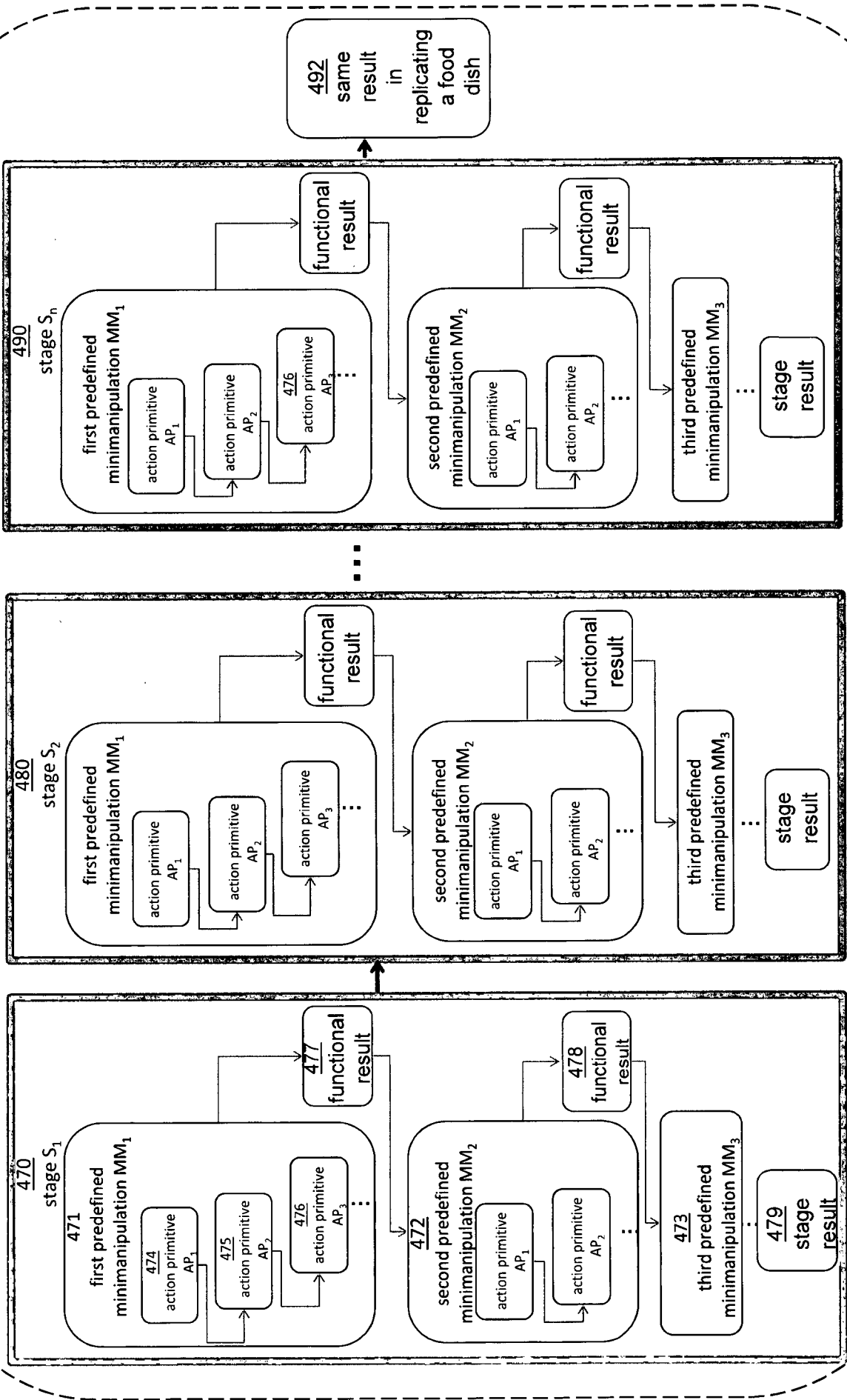
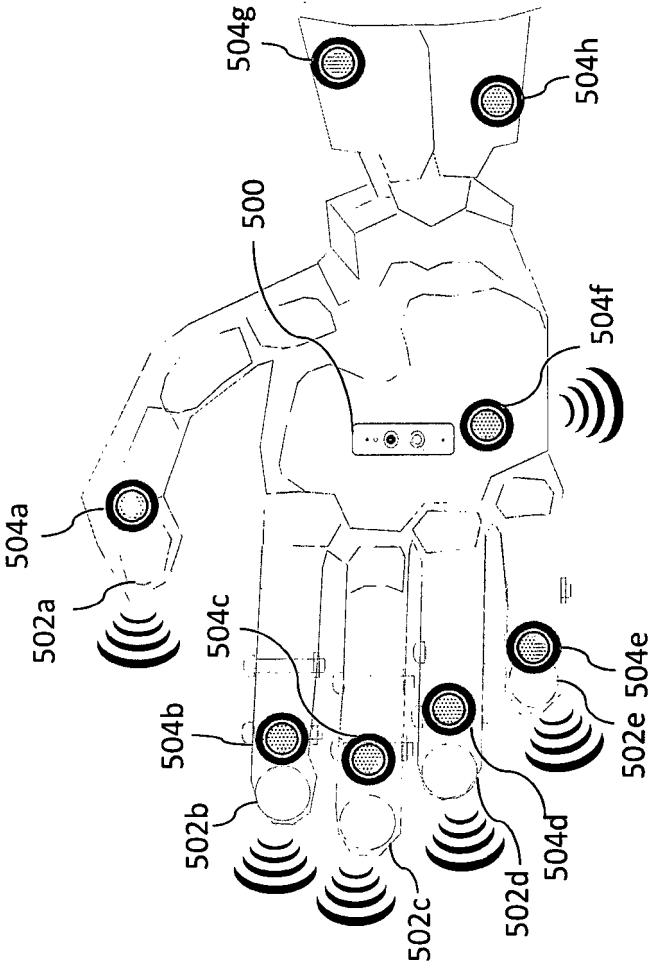


FIG. 8G

72
robotic hand



500
RGB-D (color image and depth) sensor
camera placed in the middle of the
palm of the robotic hand for detecting
the shape of an object and handling a
kitchen tool with broader vision of a
three-dimensional modeling

502a-502e
haptic vibration sensors caps
placed on the finger tips to
detect texture

504a-504h
sonar placed on fingers in the middle of the palm
of the robotic hand (sensor, laser, or RFID) and
wrist for detecting the distance of an object and
handling a kitchen tool

FIG. 9A

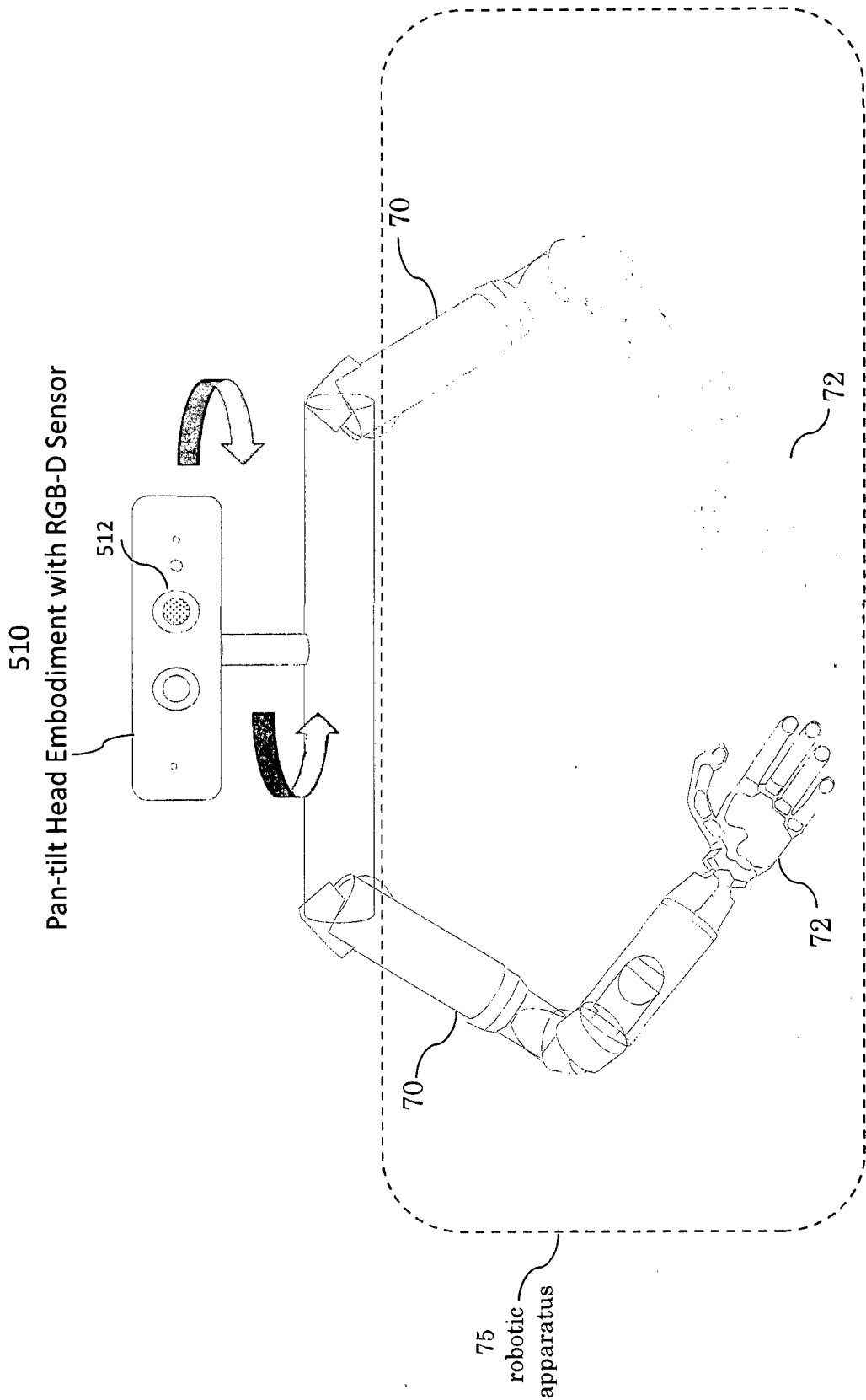


FIG. 9B

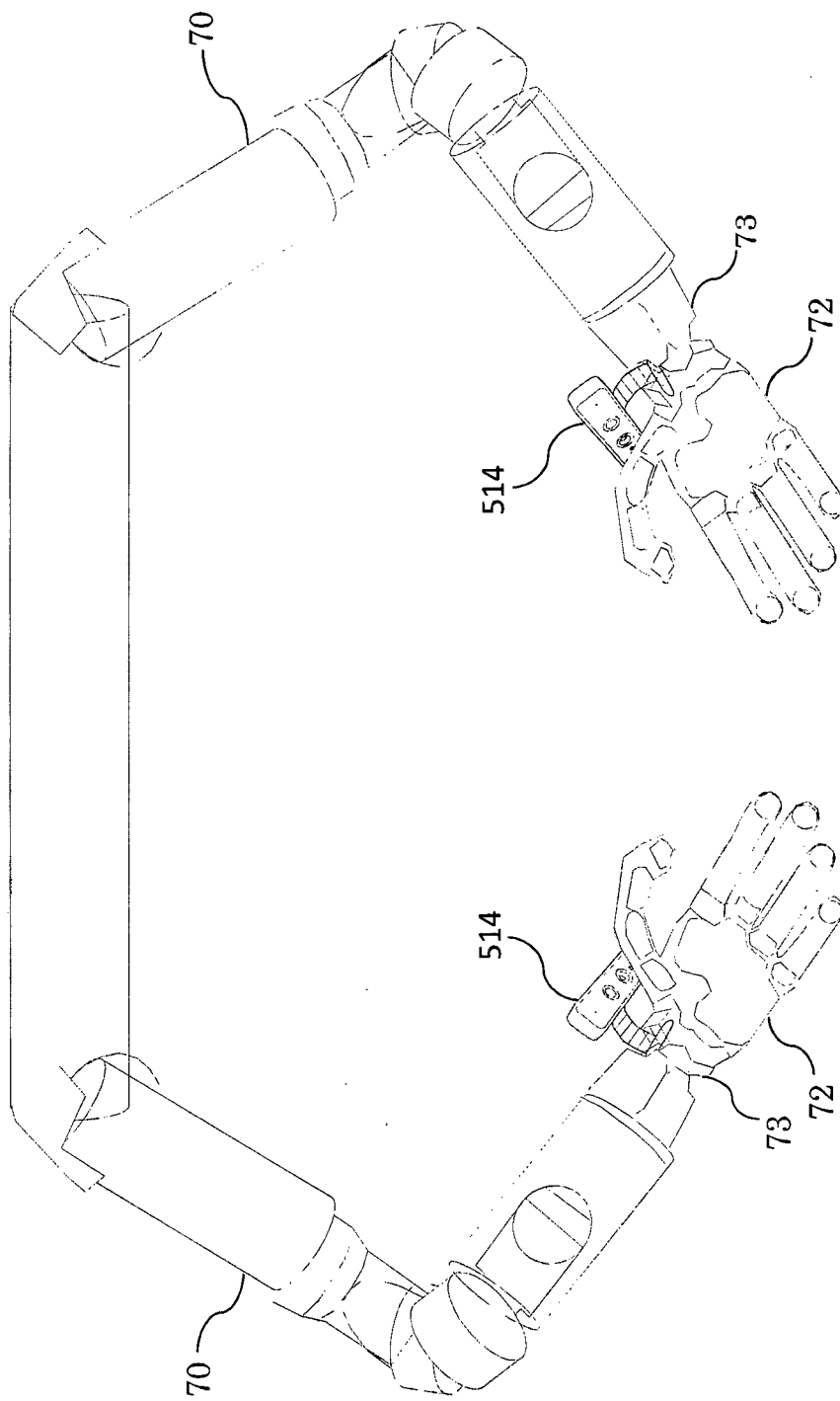


FIG. 9C

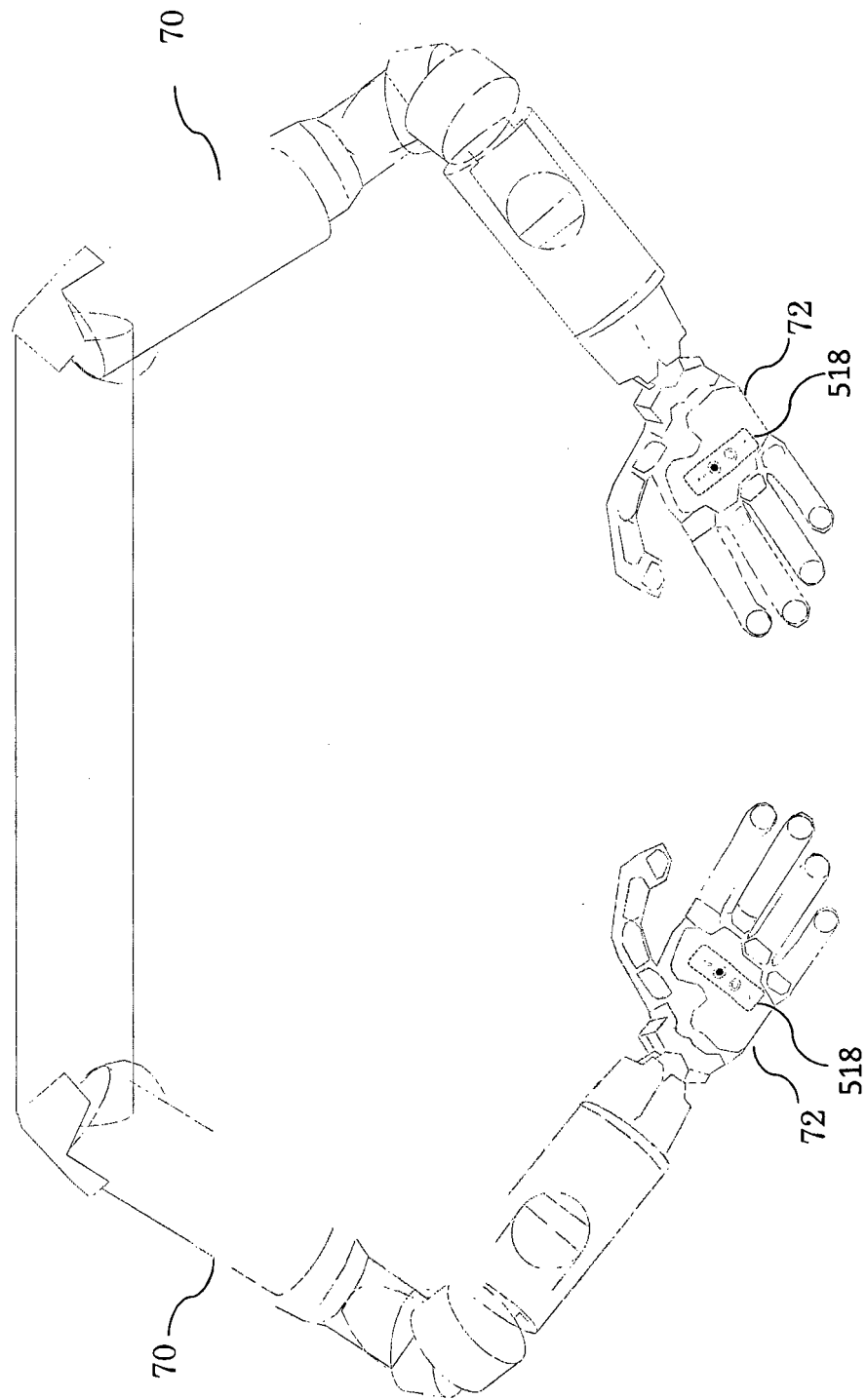


FIG. 9D

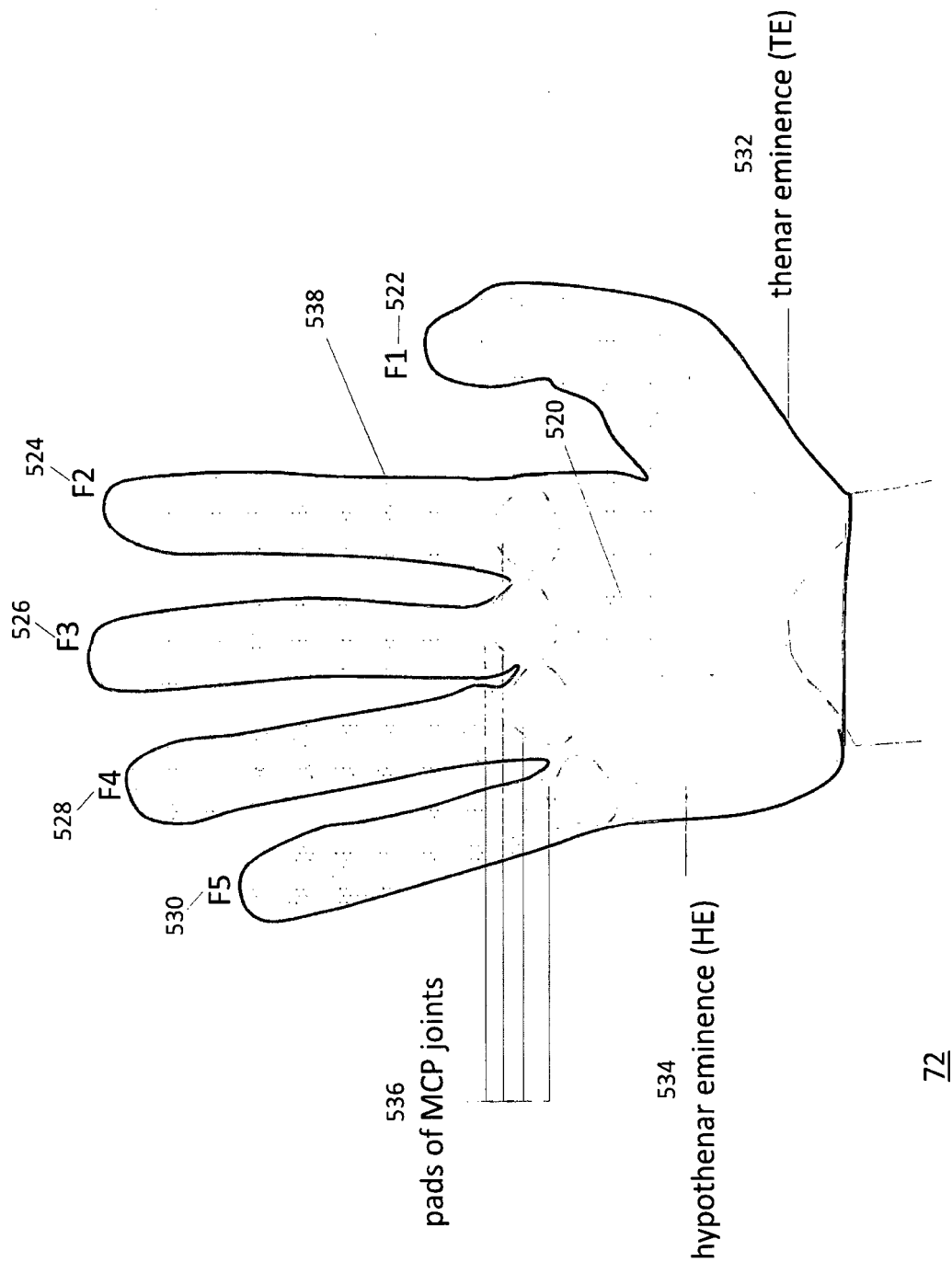


FIG. 9E

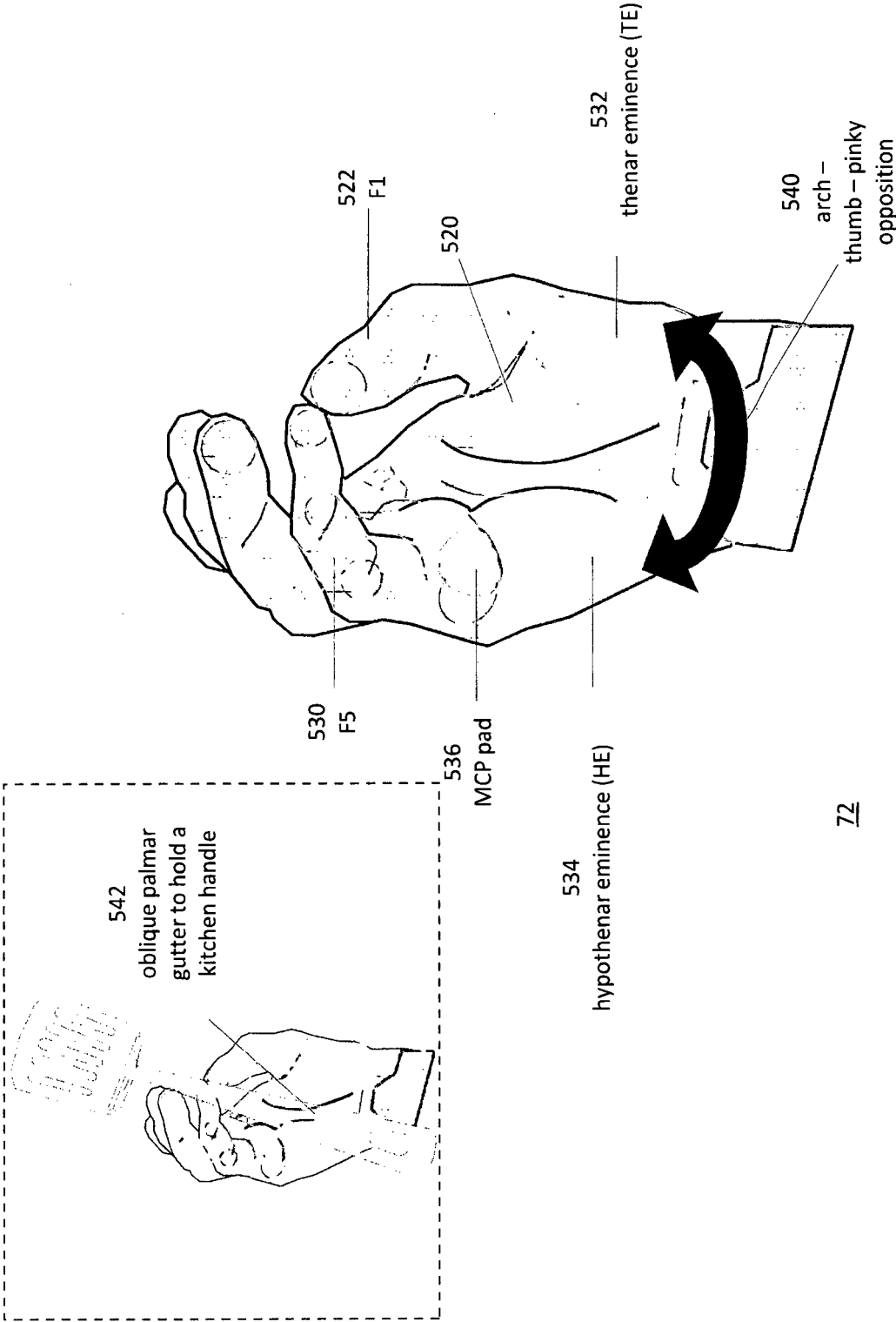


FIG. 9F

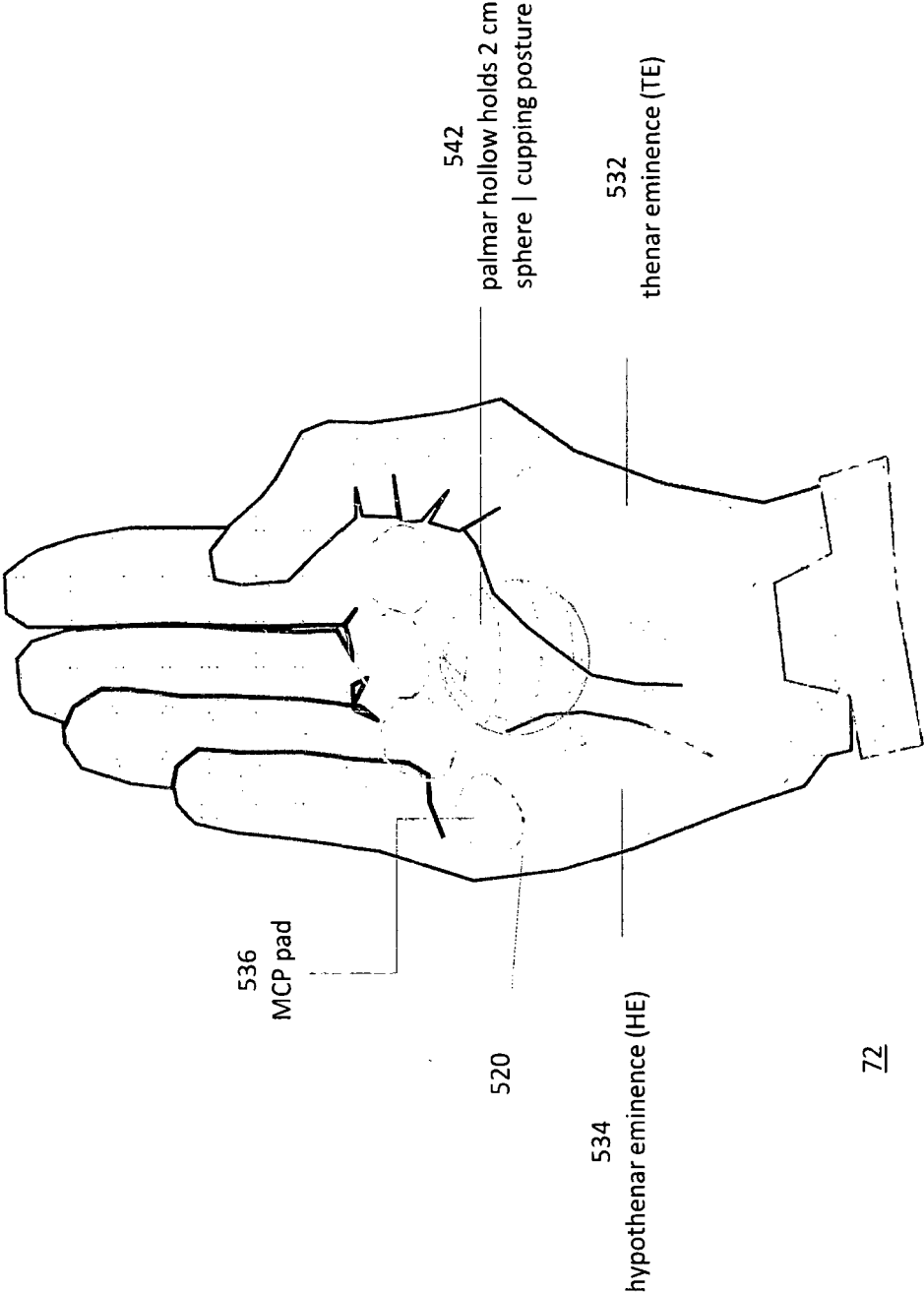


FIG. 9G

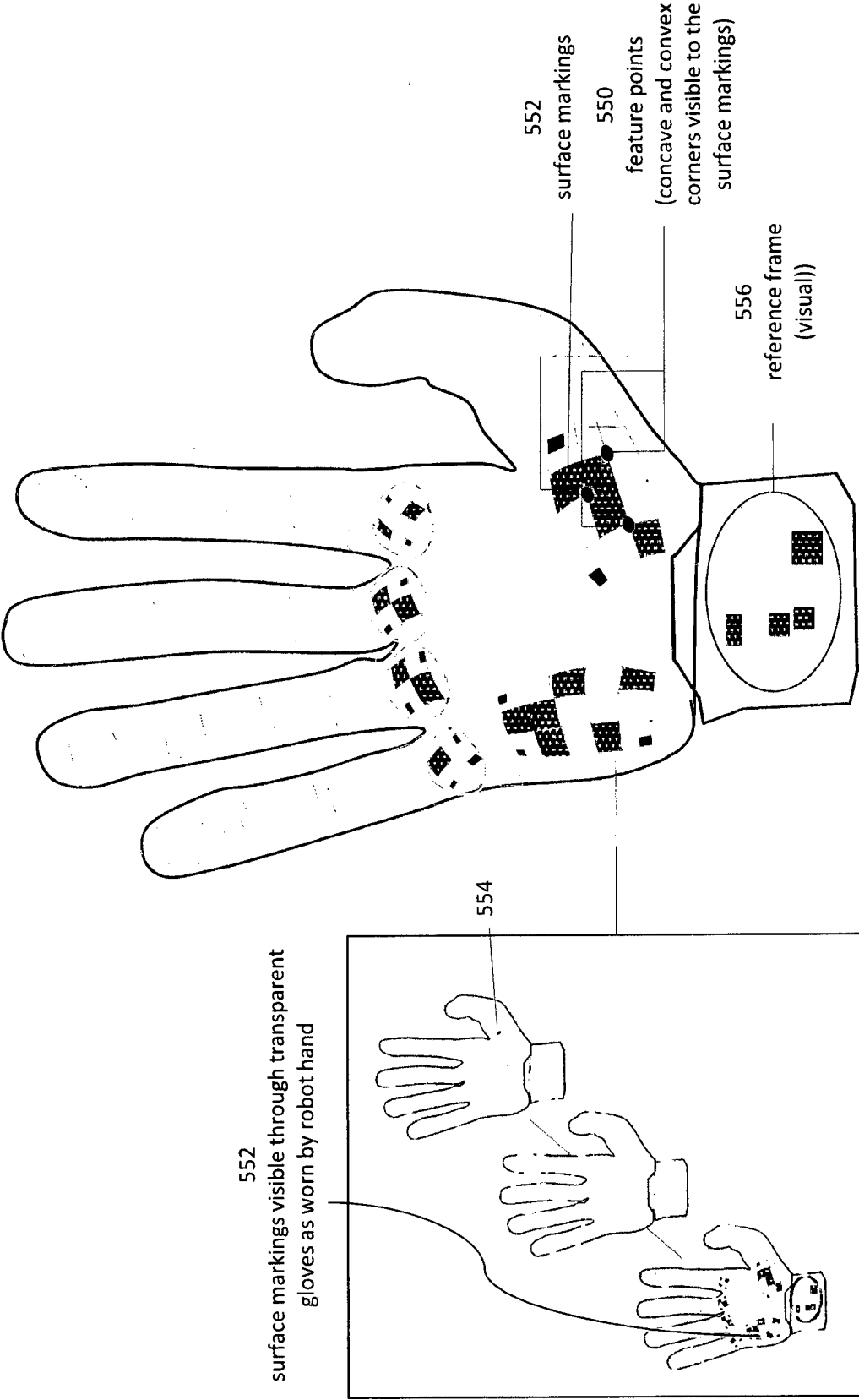


FIG. 9H

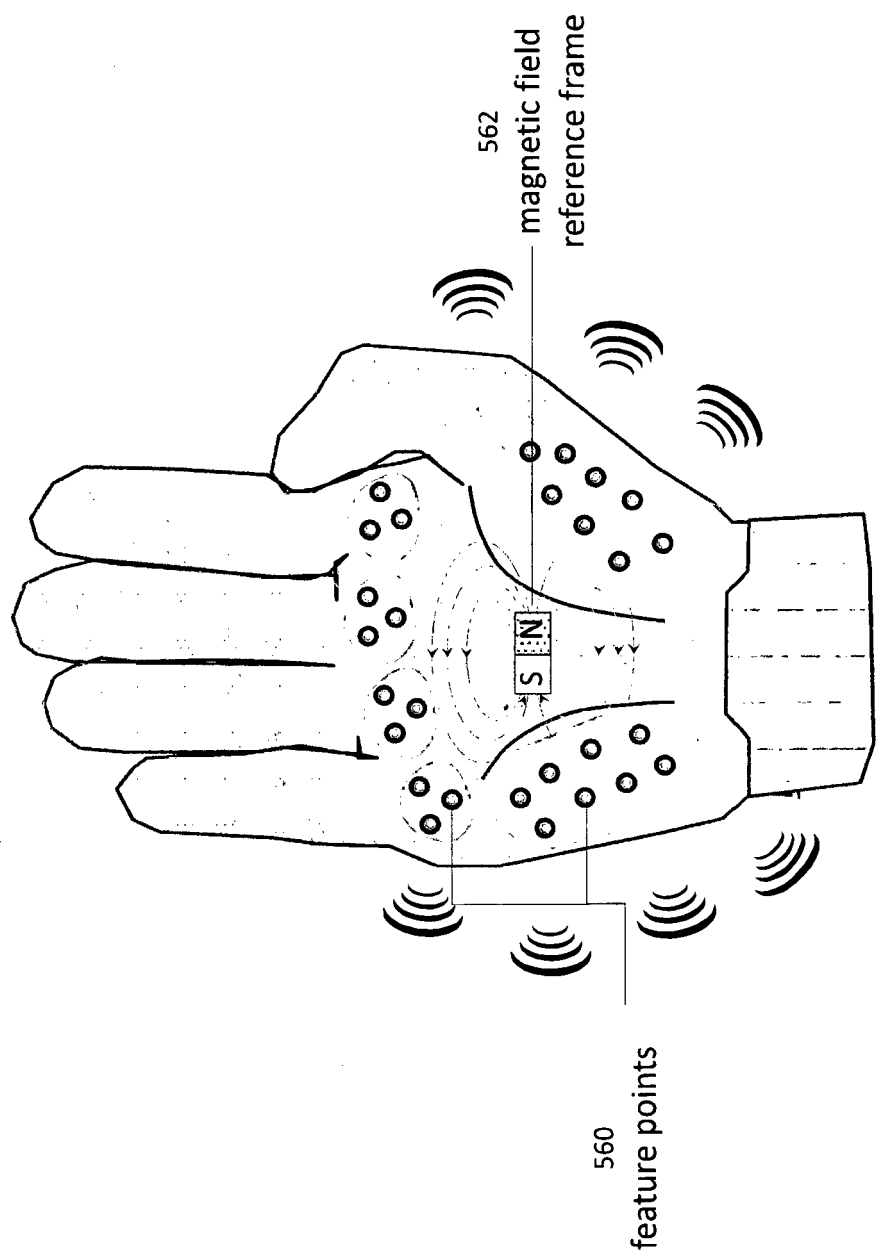


FIG. 9I

550
Chef Robot
Recorder
Devices

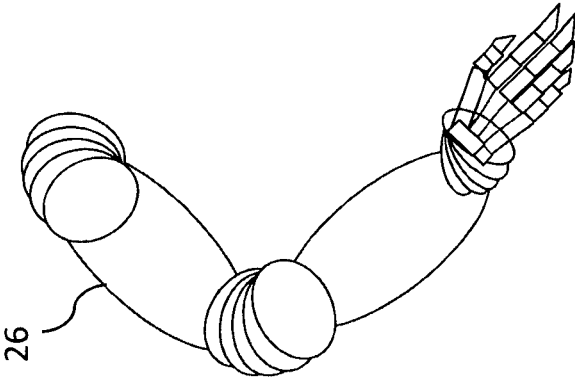
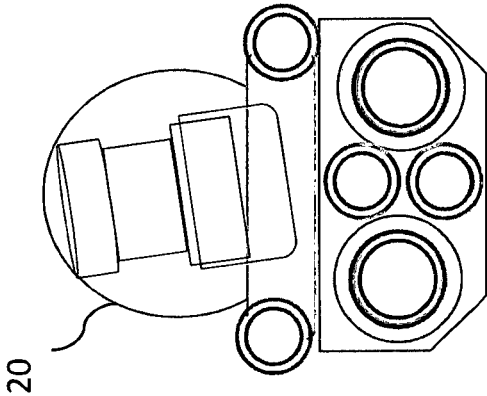
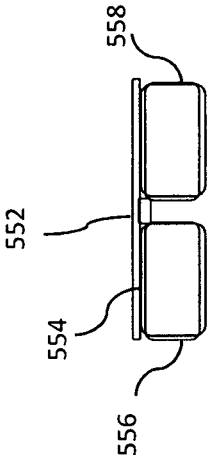


FIG. 10A

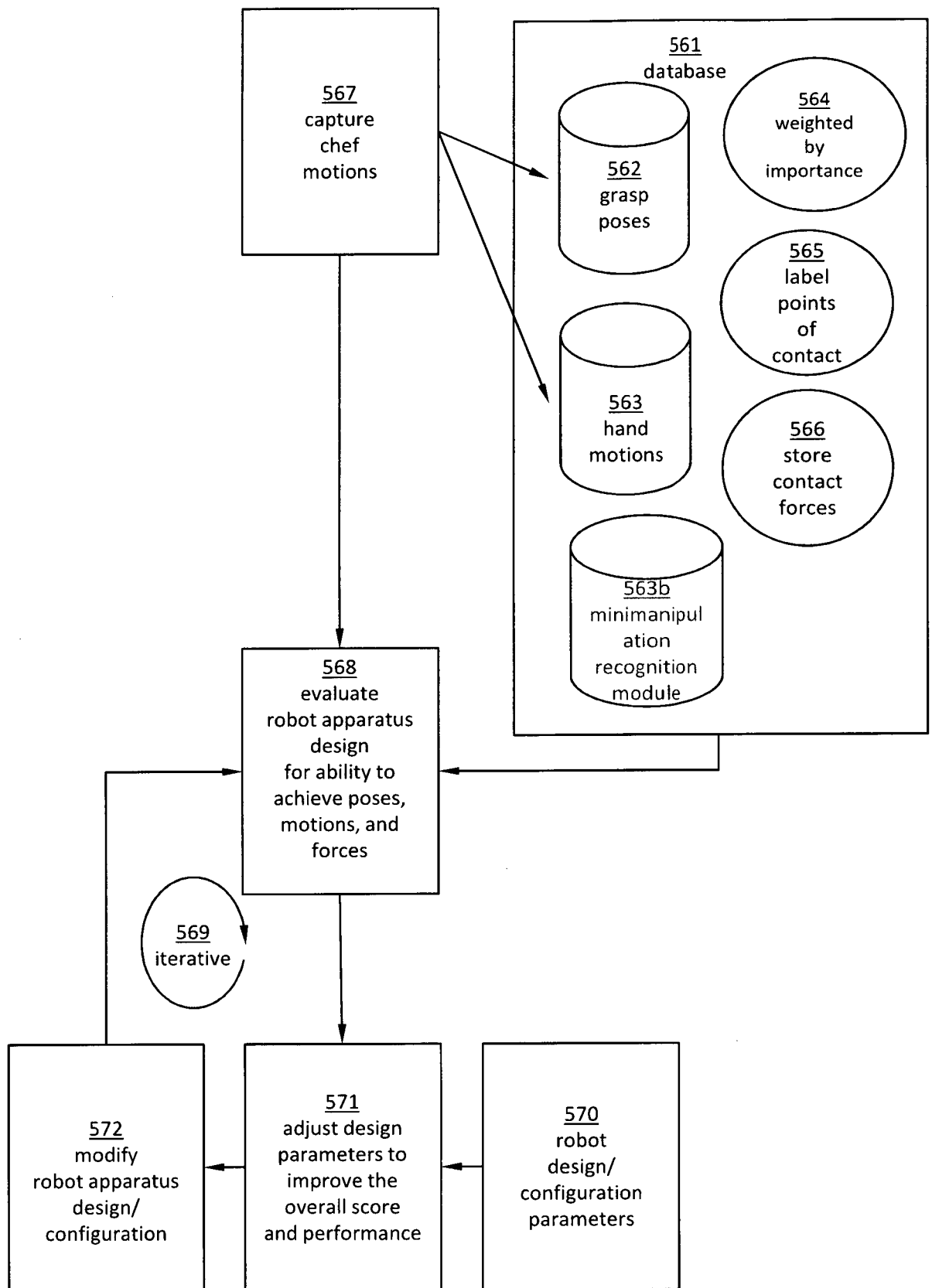
560

FIG. 10B

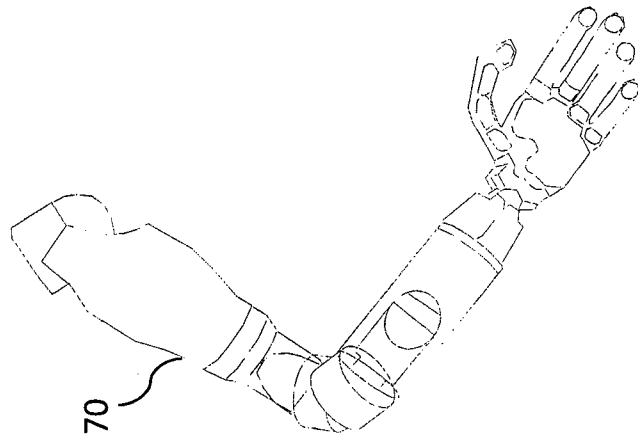


FIG. 11

FIG. 12A

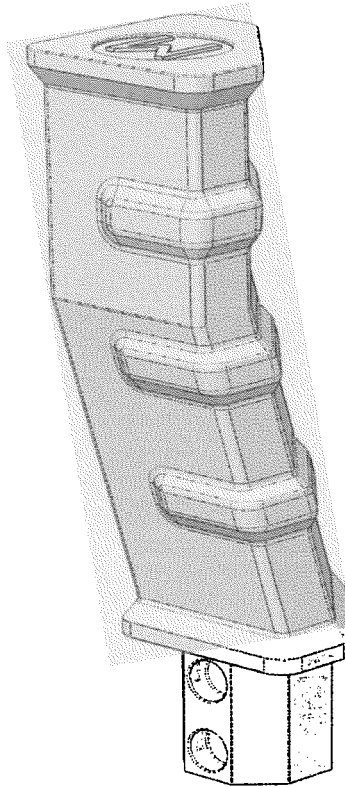
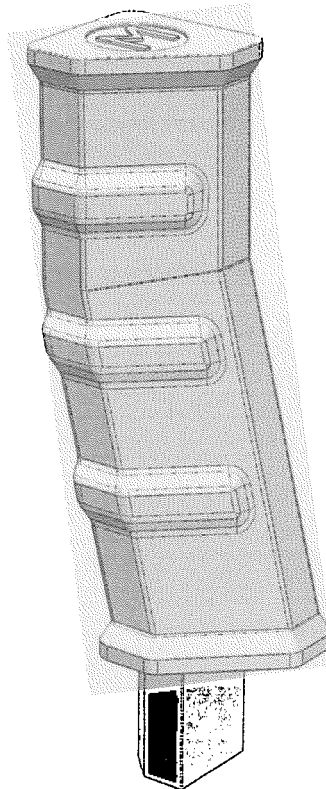
580

FIG. 12B

580

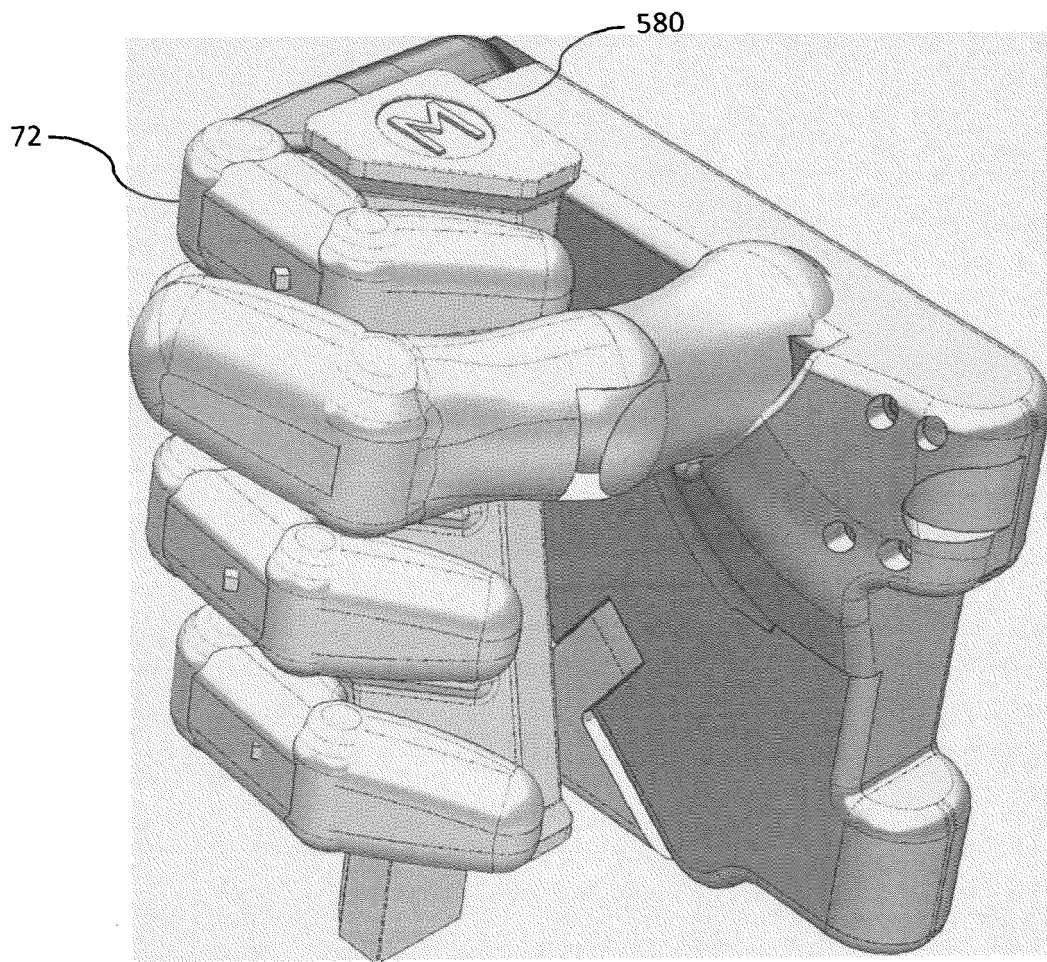


FIG. 12C

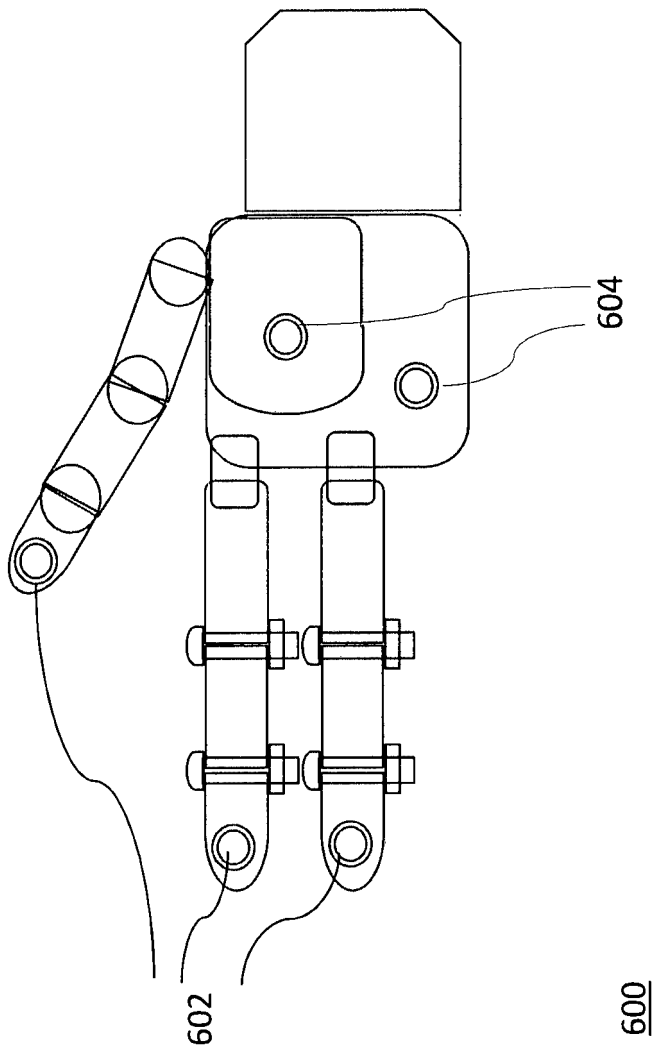


FIG. 13

620
Sensing Costume

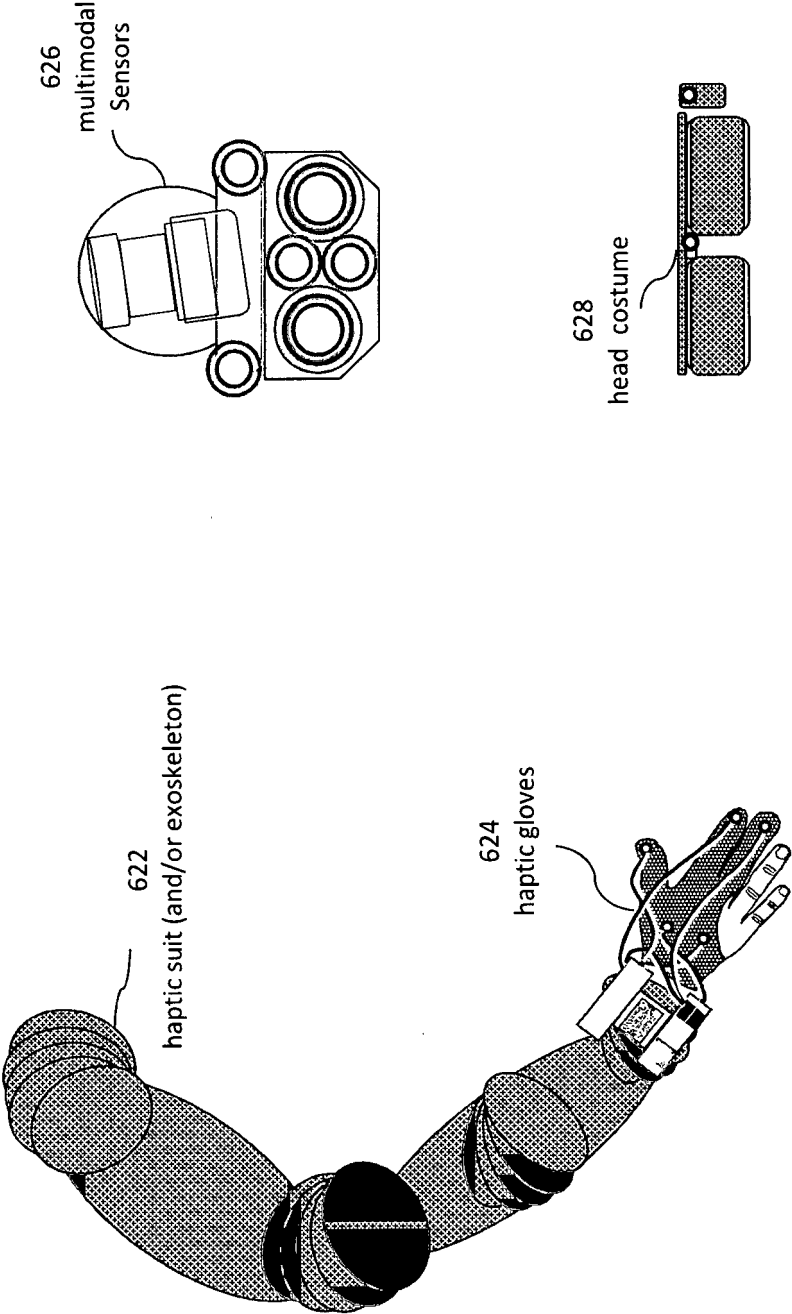


FIG. 14

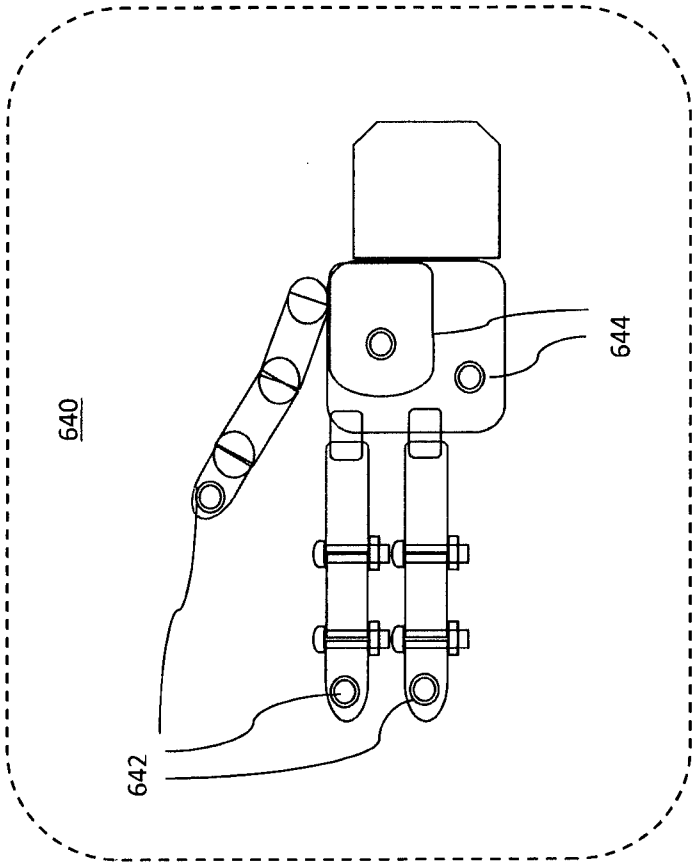


FIG. 15B

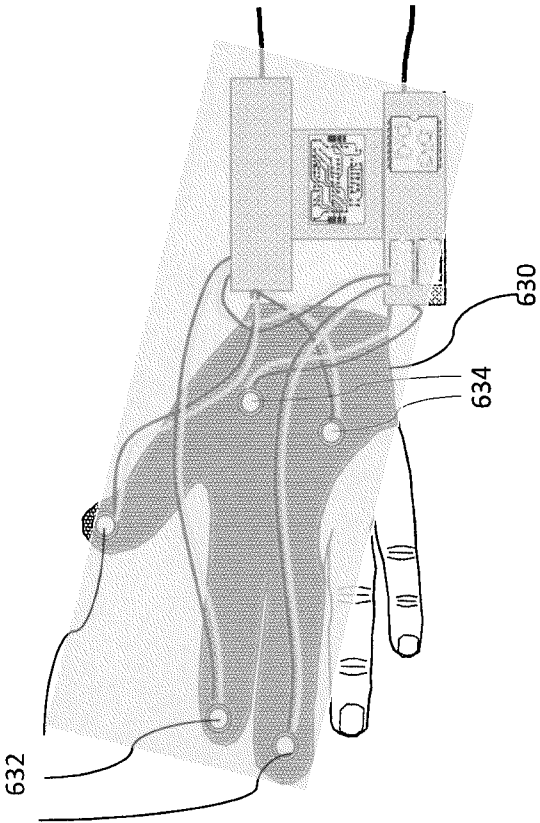


FIG. 15A

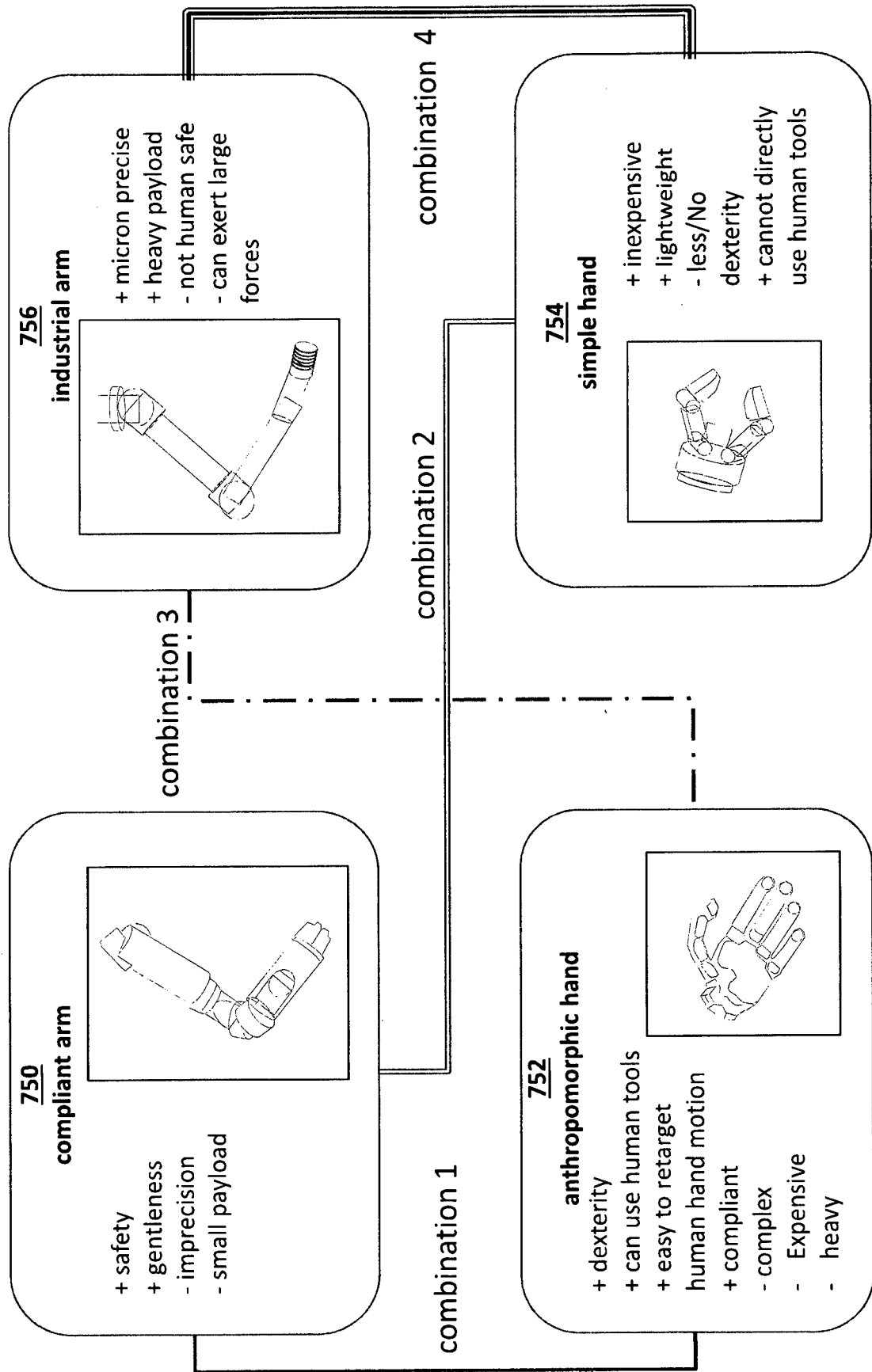


FIG. 15C

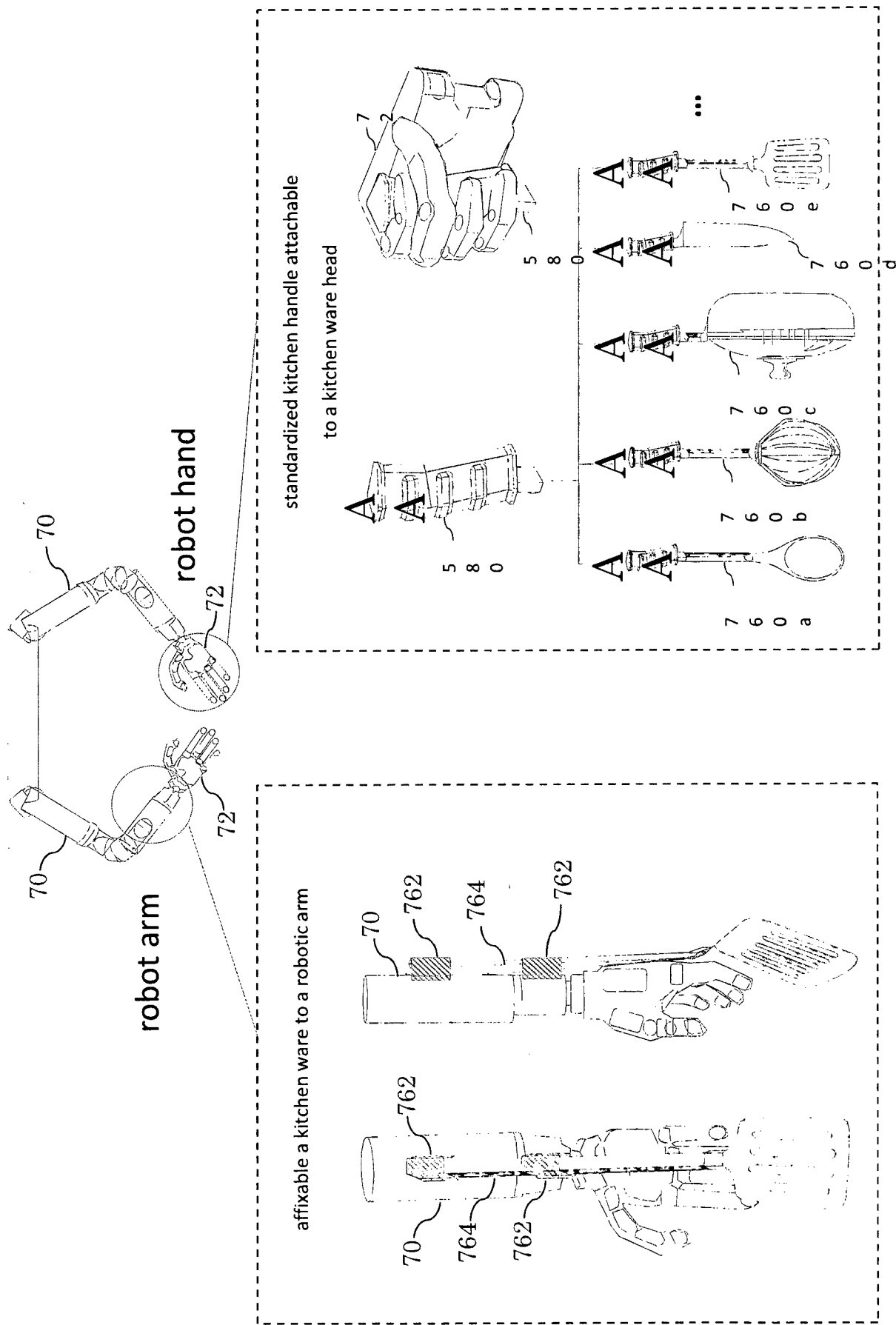


FIG. 15D

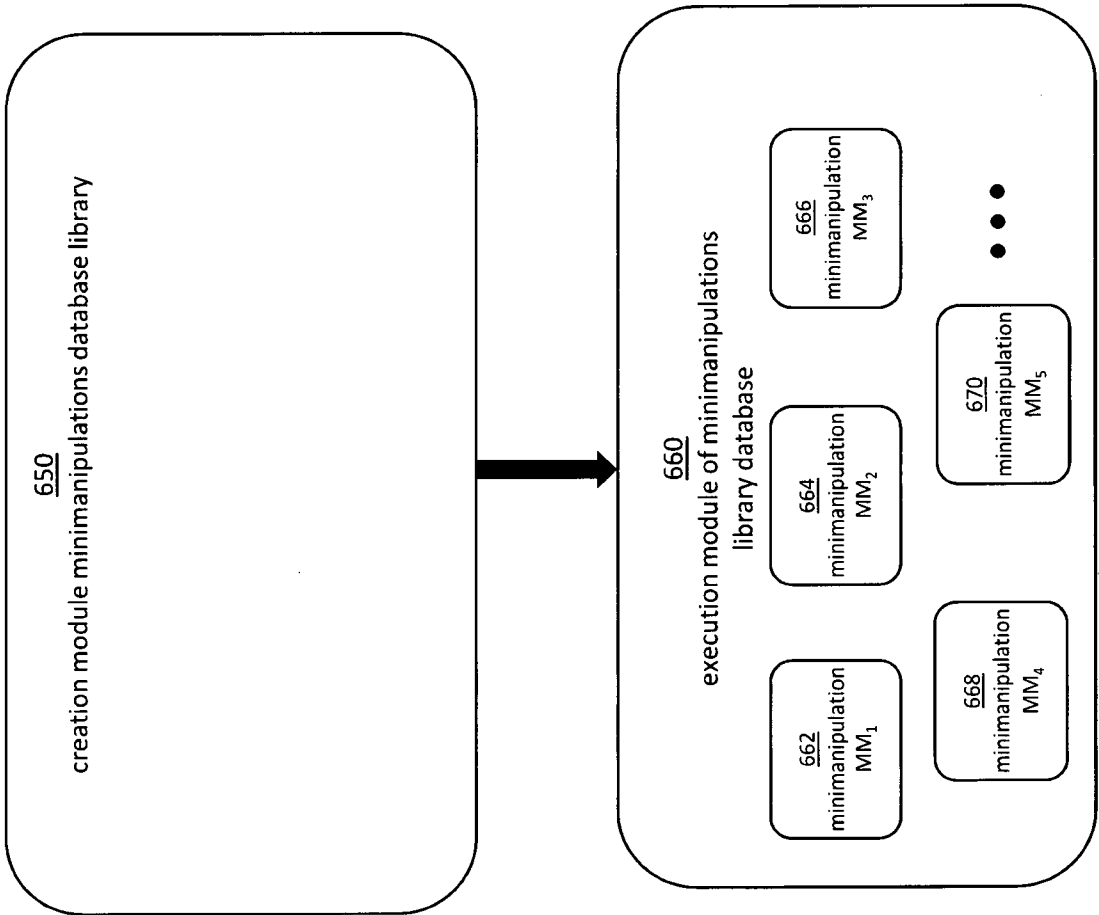


FIG. 16

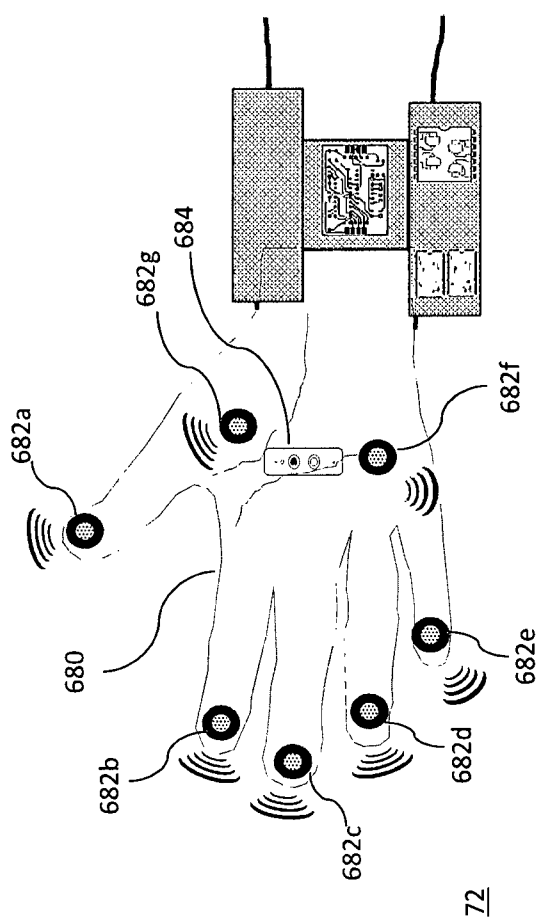


FIG. 17A

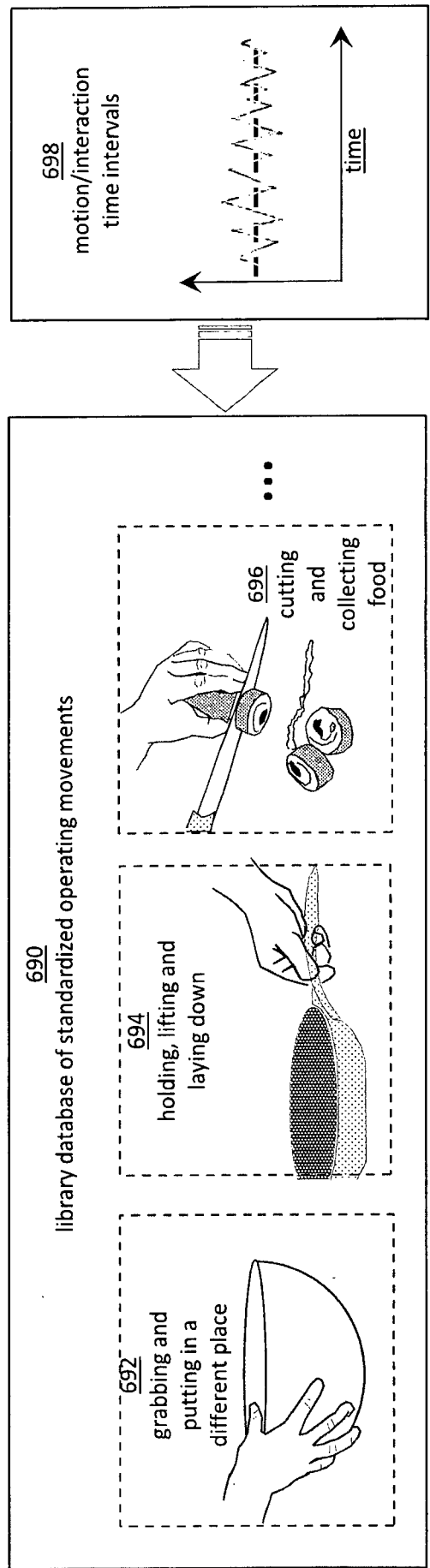


FIG. 17B

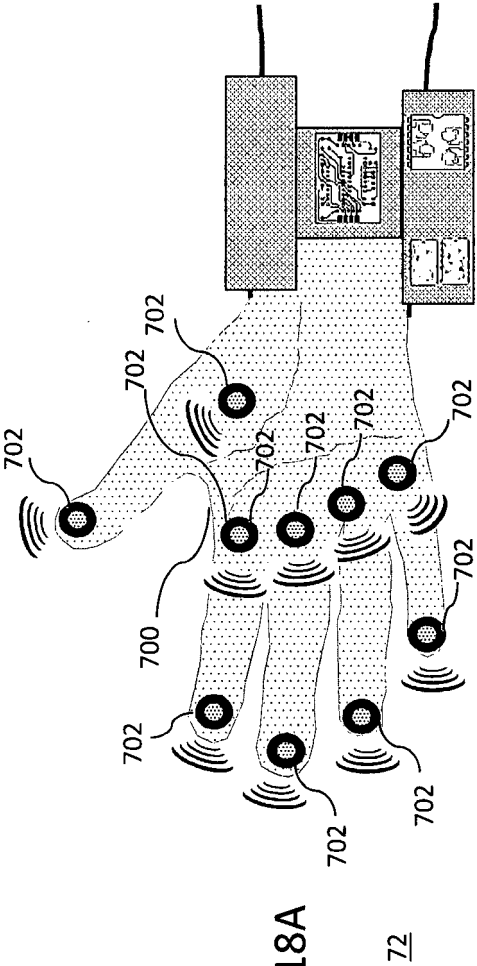


FIG. 18A

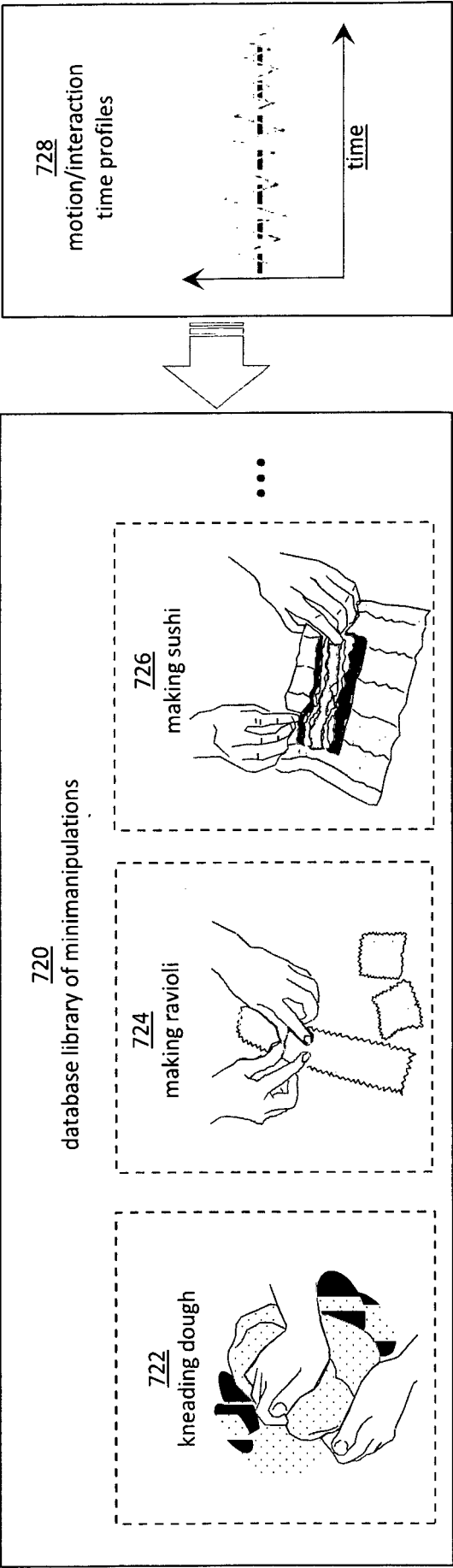


FIG. 18B

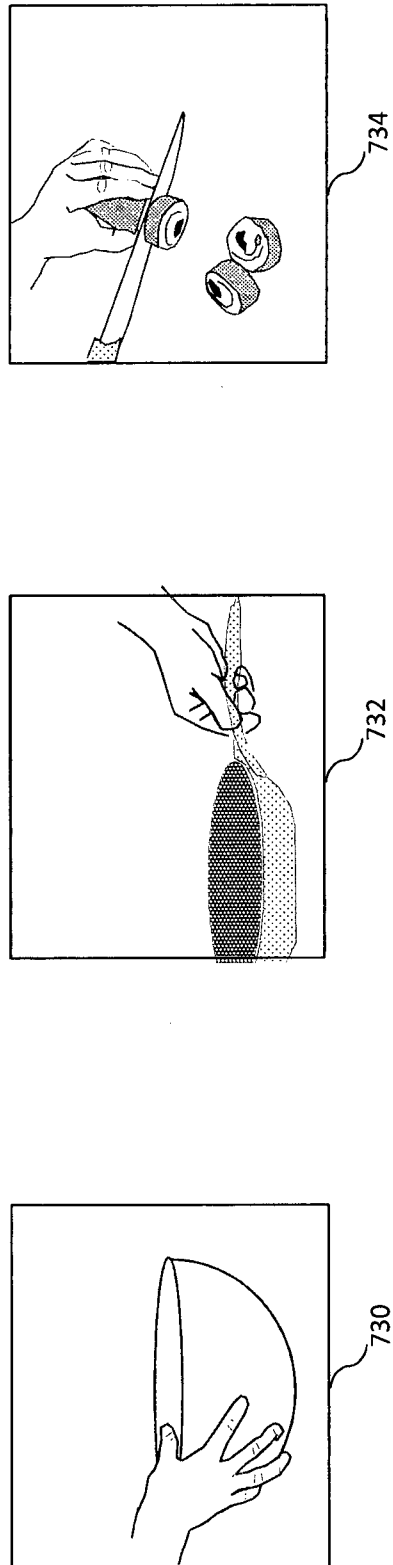


FIG. 18C

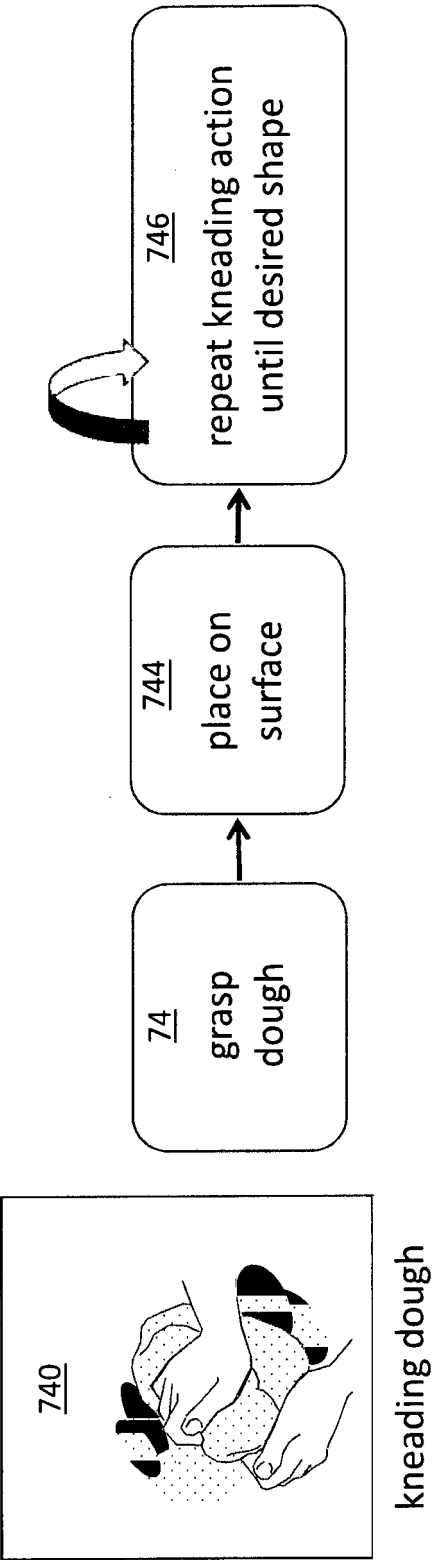


FIG. 18D

770

Creation of a Minimanipulation (MM)

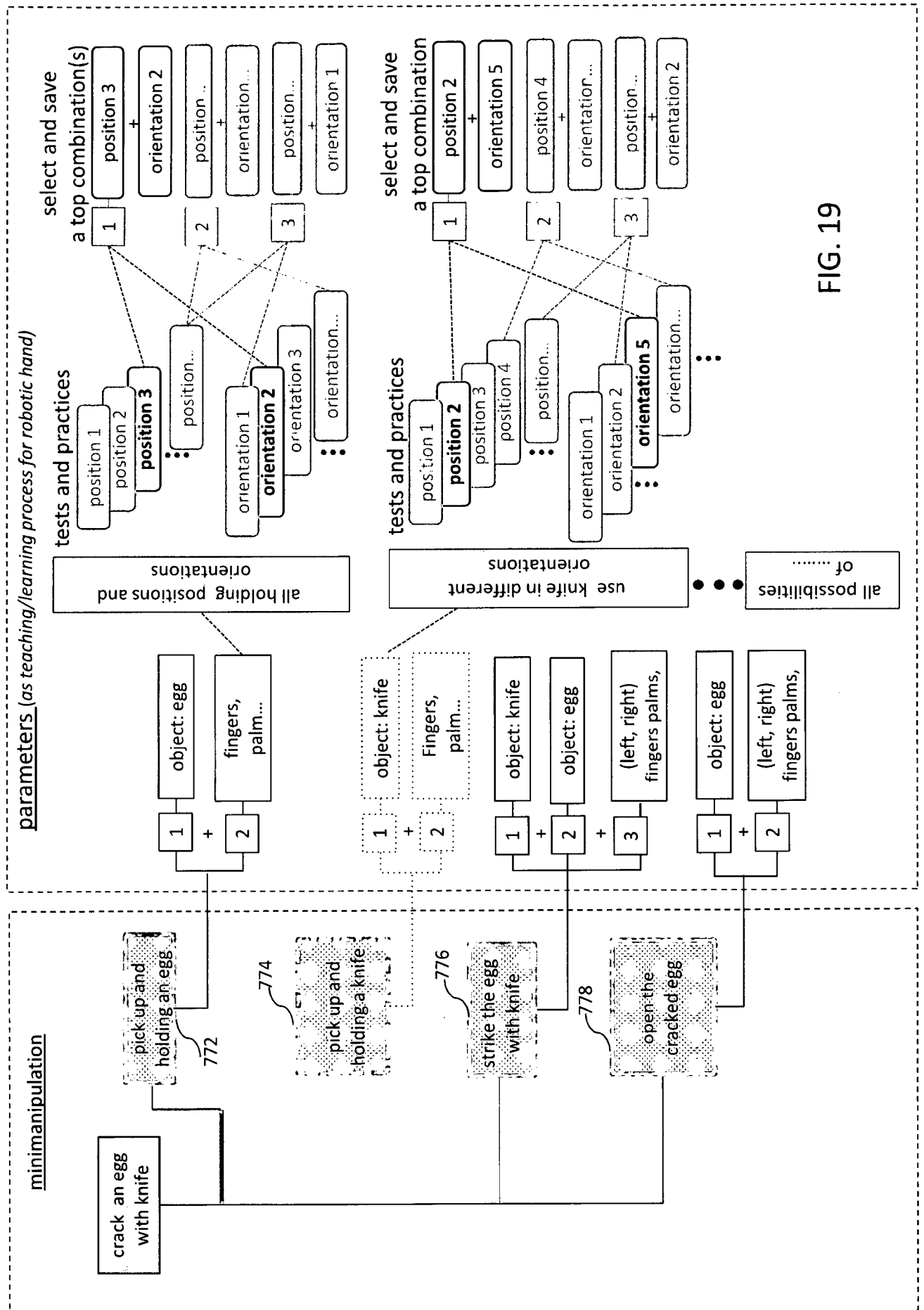


FIG. 19

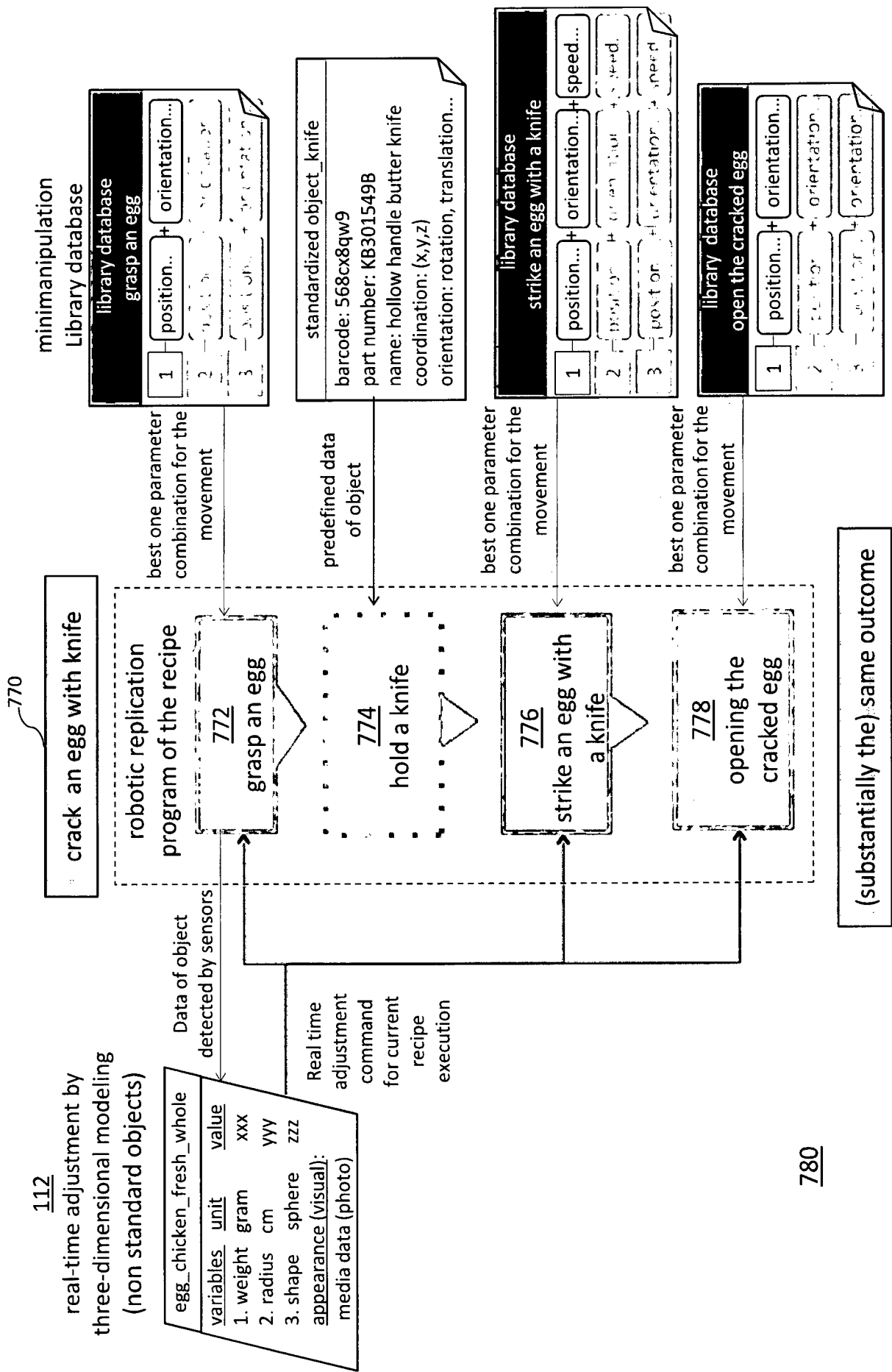


FIG. 20

782
Chef Studio Cooking Capture Process

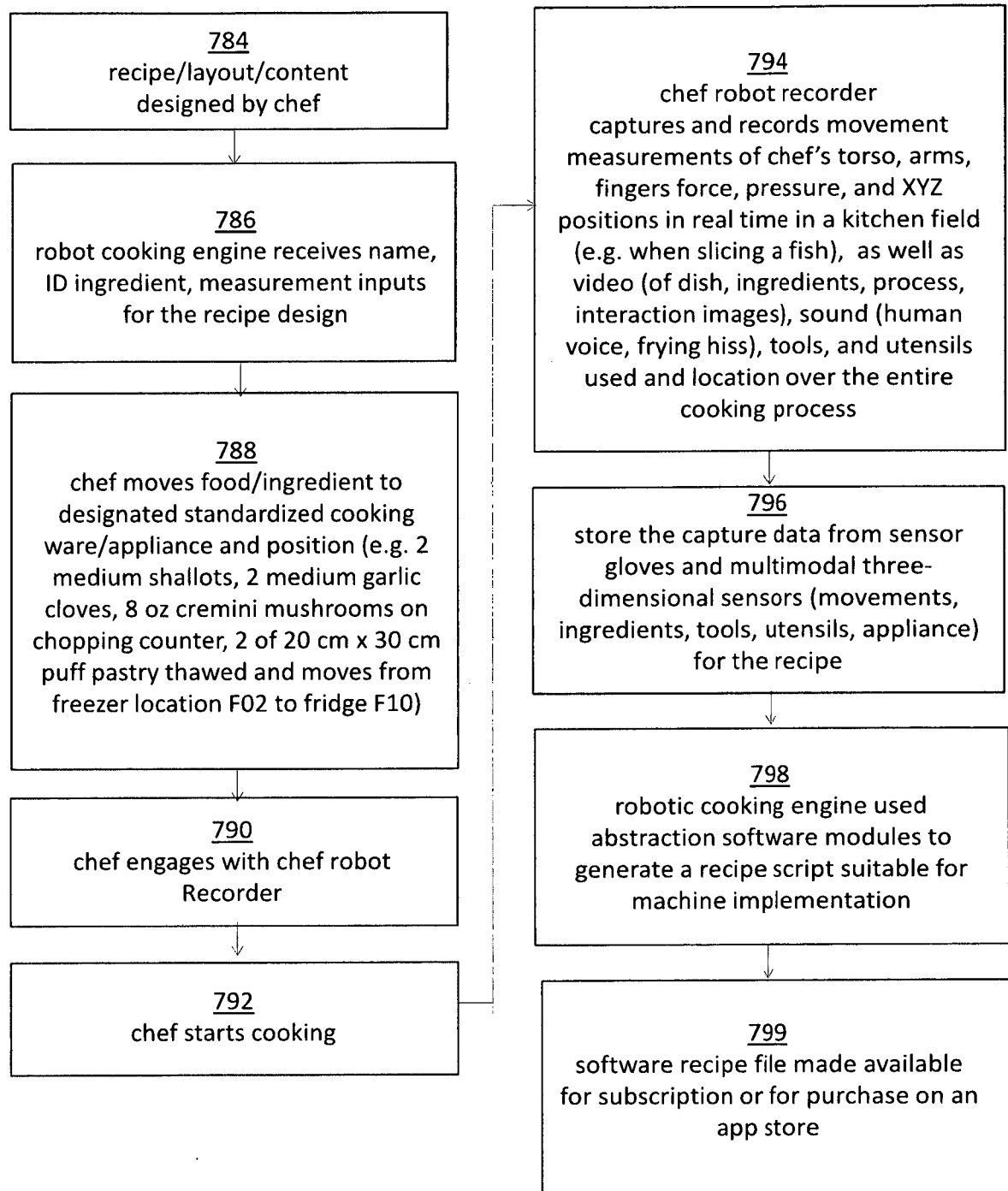


FIG. 21

800
Household Robotic Cooking

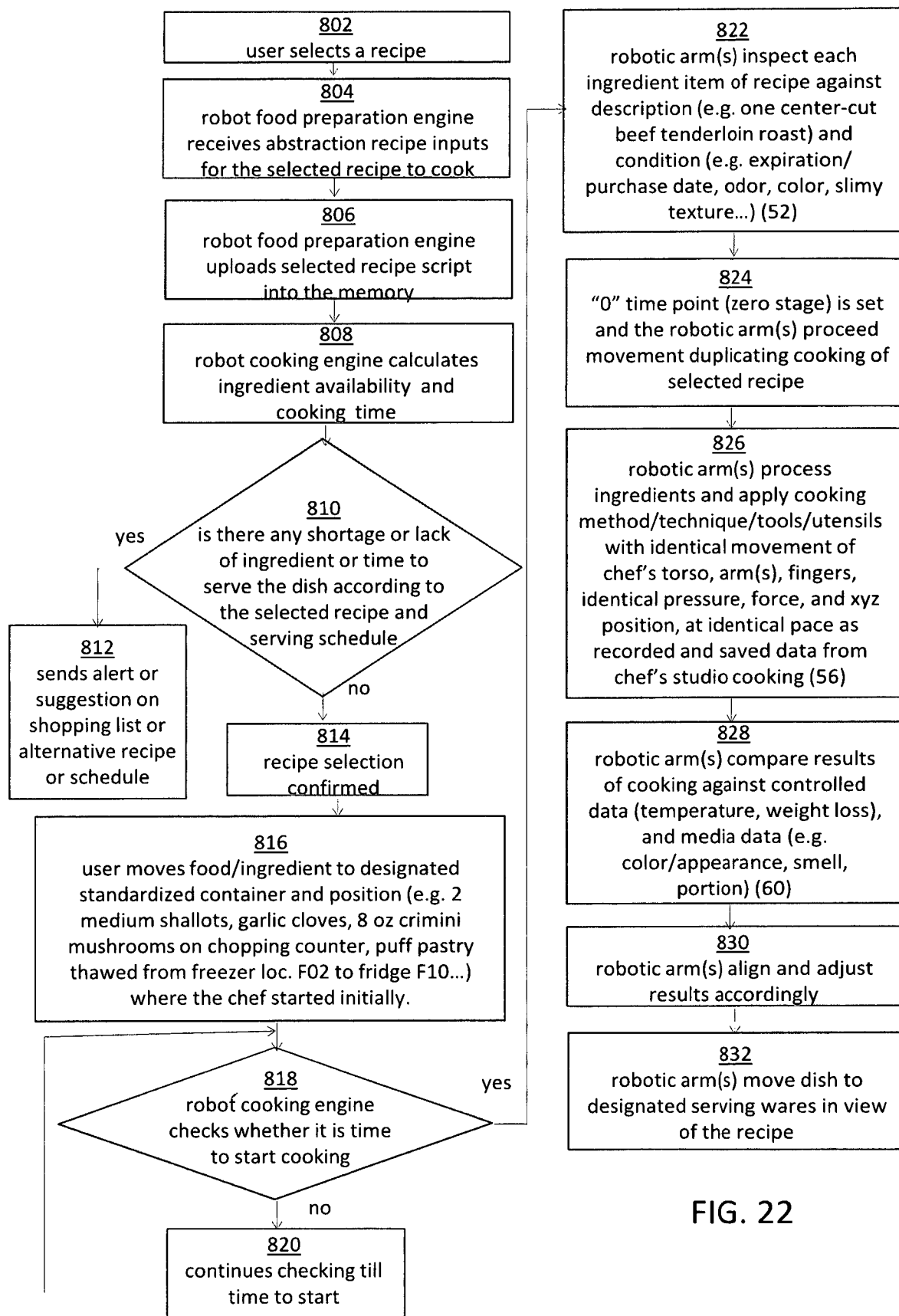


FIG. 22

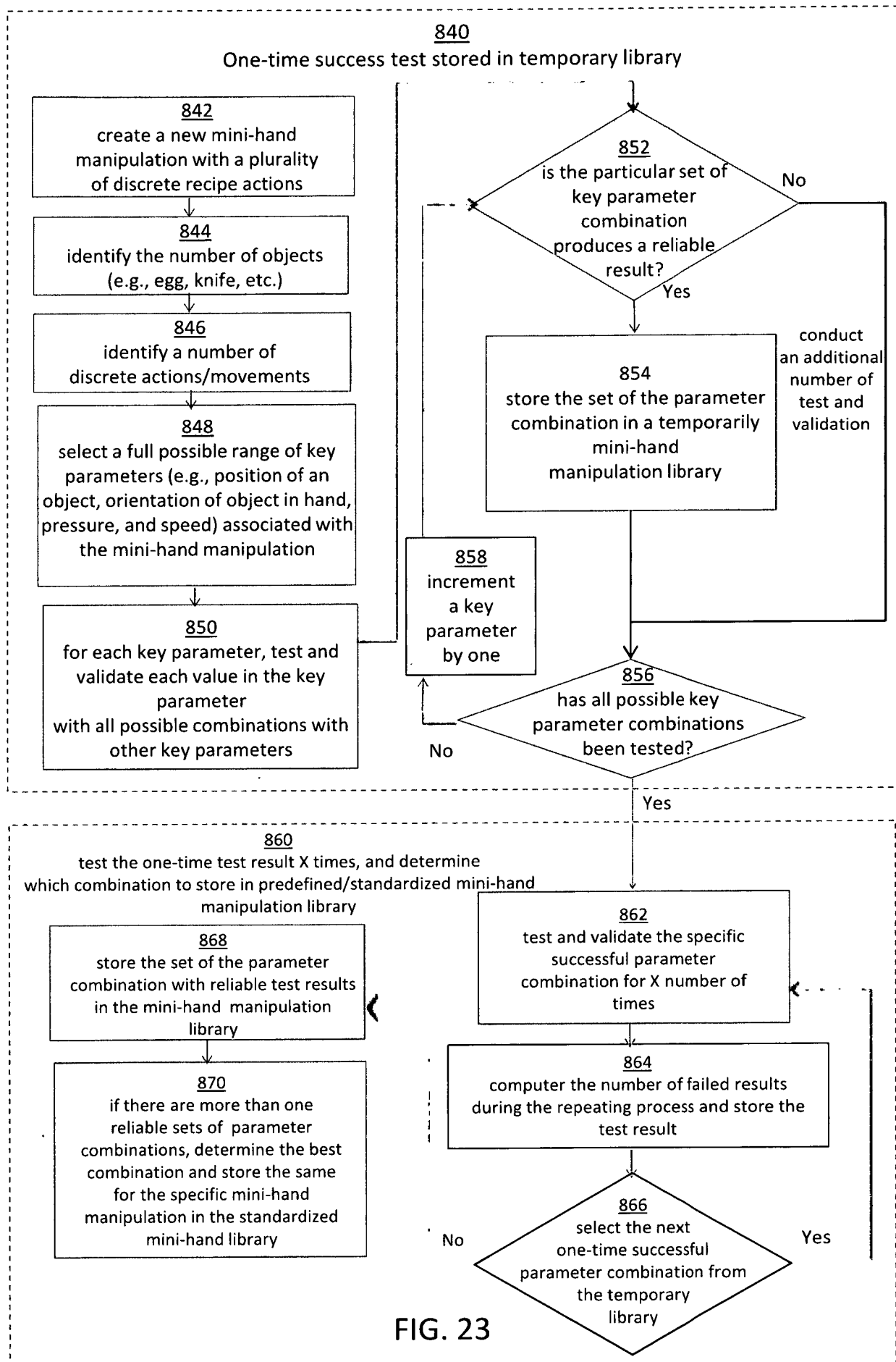
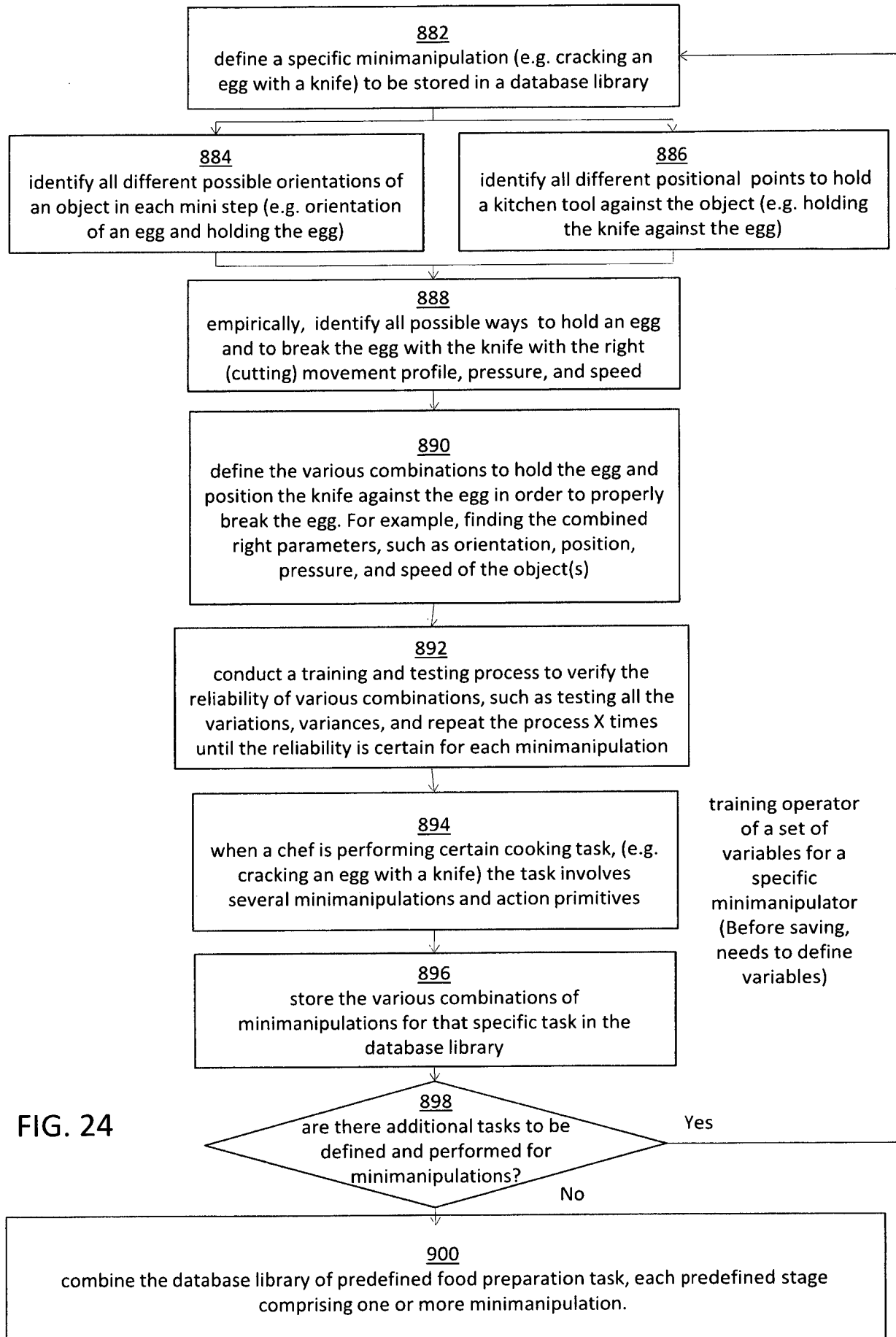
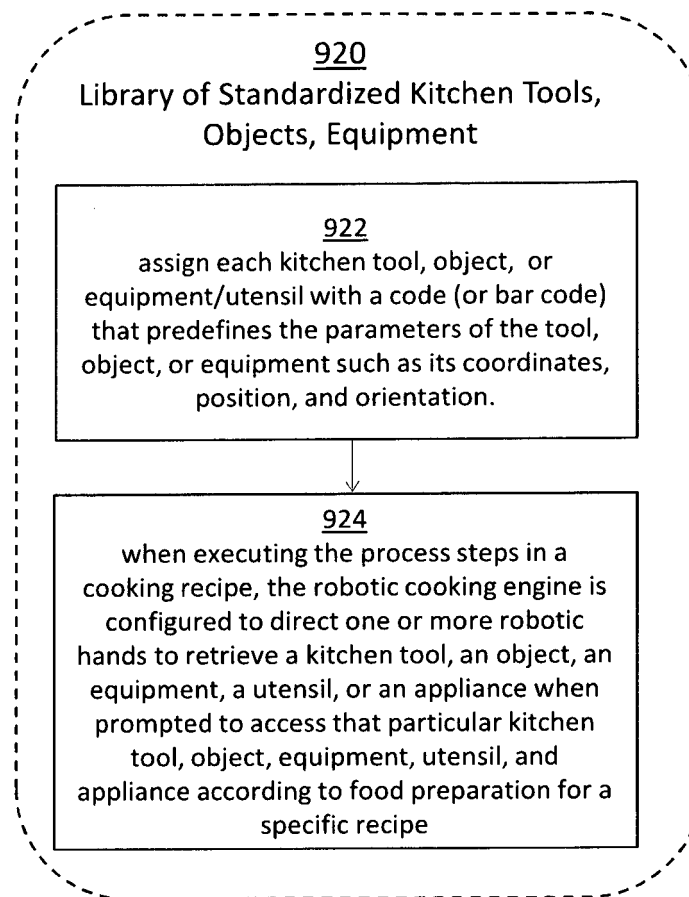


FIG. 23

880

Library of minimanipulations





Create a code for
a 3D model for
each
object/standard
kitchen with
precise shape and
dimension for
future unlimited
use

FIG. 25

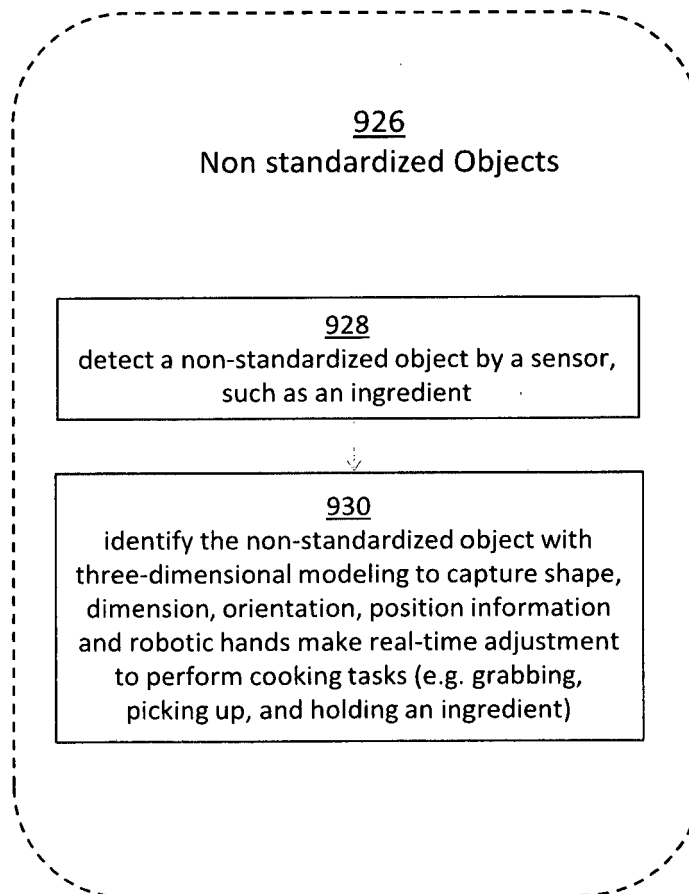


FIG. 26

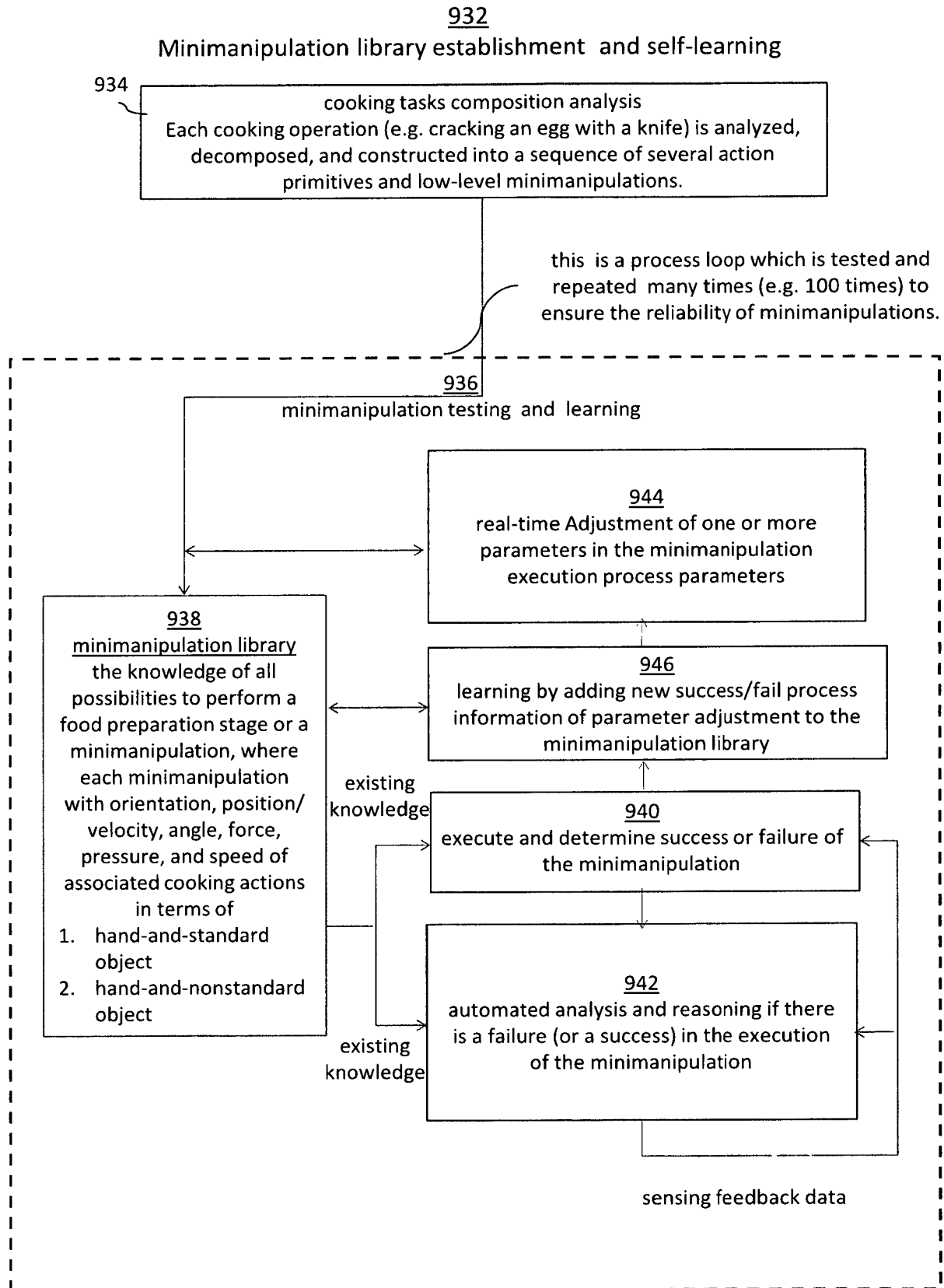


FIG. 27

950

Robotic arms quality control and alignment function process

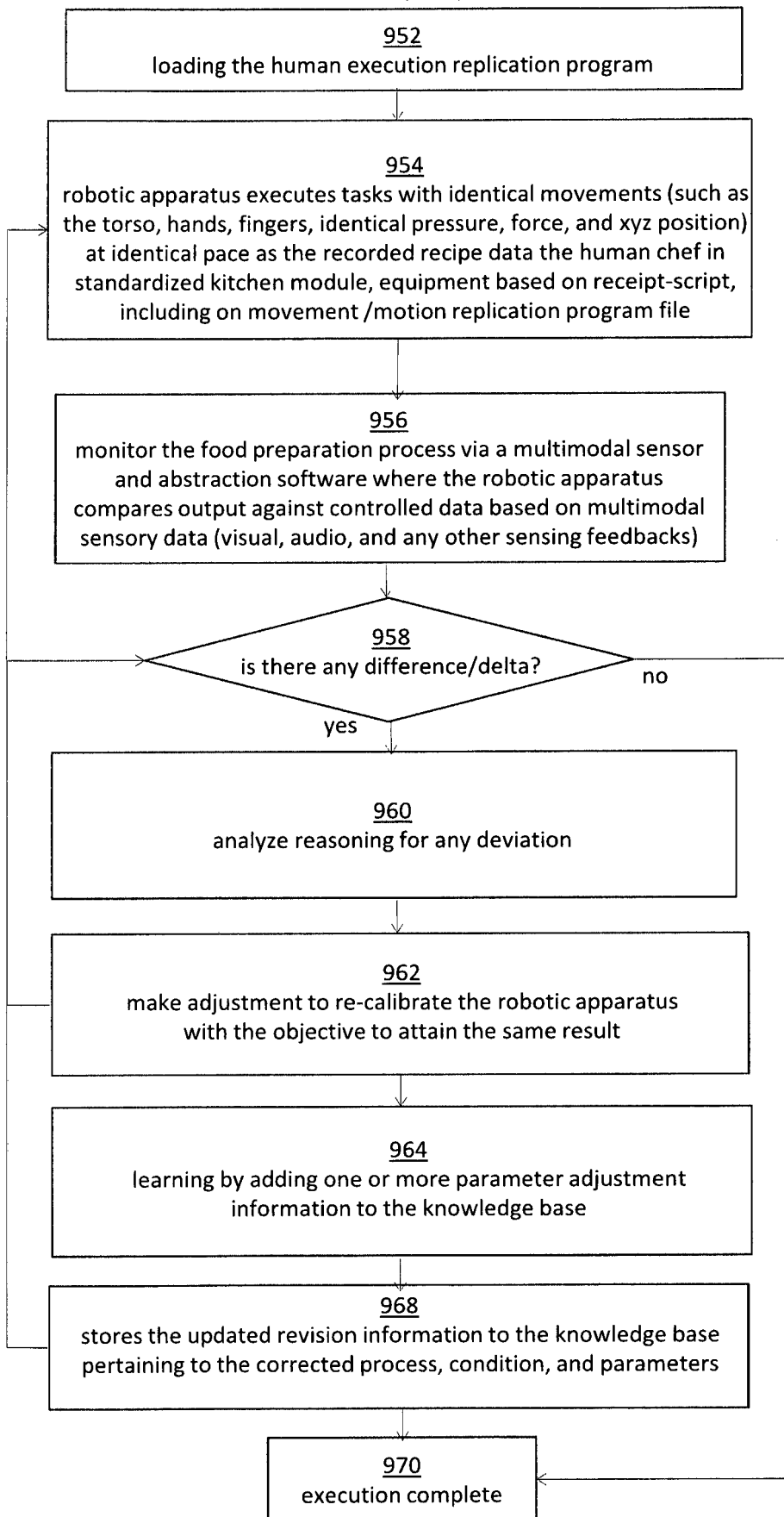


FIG. 28

Database Structure of Minimanipulation (MM) library

name of MM	code of MM	code(s) of standardized equipment and tools associated with the performance of MM	initial position and orientation of the manipulated (standard or non-standard) objects (ingredients and tools) in a robotic hand	parameters/Variable defined by user (or taking from recorded recipe during execution):				Sequence of robotic hand movements (control signals for all servos) and connecting feedback parameters (from any sensors or video recognizing system) of MM on the timeline. The variables are an initial data information for the sequence.
				MM Starting coordinate XYZ in the volume of the standardized kitchen module	MM speed	MM object size (may be non-standard)	MM object shape (may non-standard)	

FIG. 29

name of objects	image of object	code of object	virtual 3D model with full dimensions of object in matrix of (XYZ coordinates matrix) (resolution preferably be defined)	virtual vector model of the object (if available)	definition and marking of the working elements of the object (the elements, which may be in contact with hands and other objects for manipulation)	initial standard orientation of object for each specific manipulations

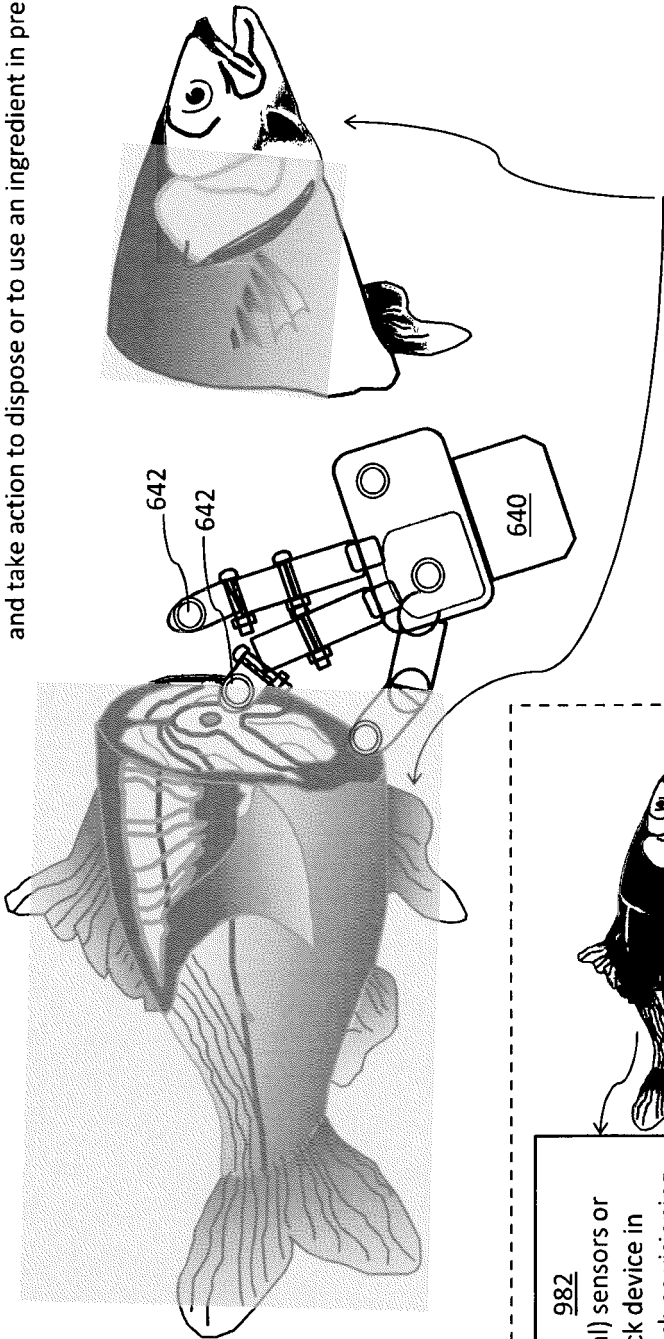
FIG. 30

980

Quality check of cooking Ingredients by one or more robotic hands

984

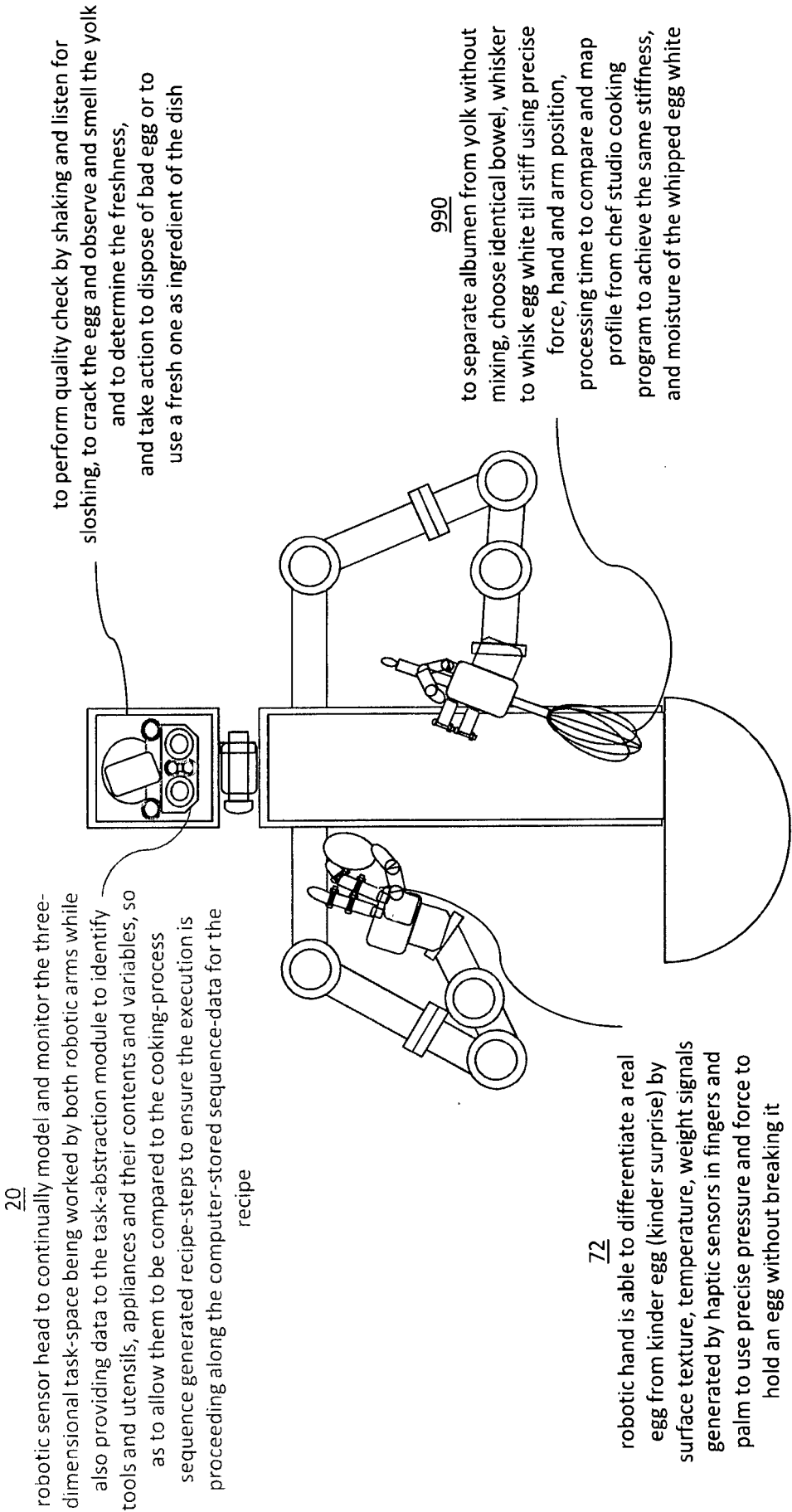
robotic hand is able to determine the freshness of cooking ingredients, such as fish or beef, by surface texture, temperature, weight signals generated by haptic sensors in fingers and palm, and take action to dispose or to use an ingredient in preparing a food dish.



986

e.g. to check the degree of freshness in fish, the robotic hand presses the meat with fingers for resilience and firmness of meat, such as to determine if the fish muscles are firmly attached to the bones; to check the moisture of gills, which preferably be wet but not slimy or dry.

FIG. 31



988

FIG. 32

1002

food containers with built-in sensors or detective device (e.g. measurement needle) for detection of temperature, and each container is made specific to certain type of meat (e.g. beef, pork, fish) or produce and sensors for detection.

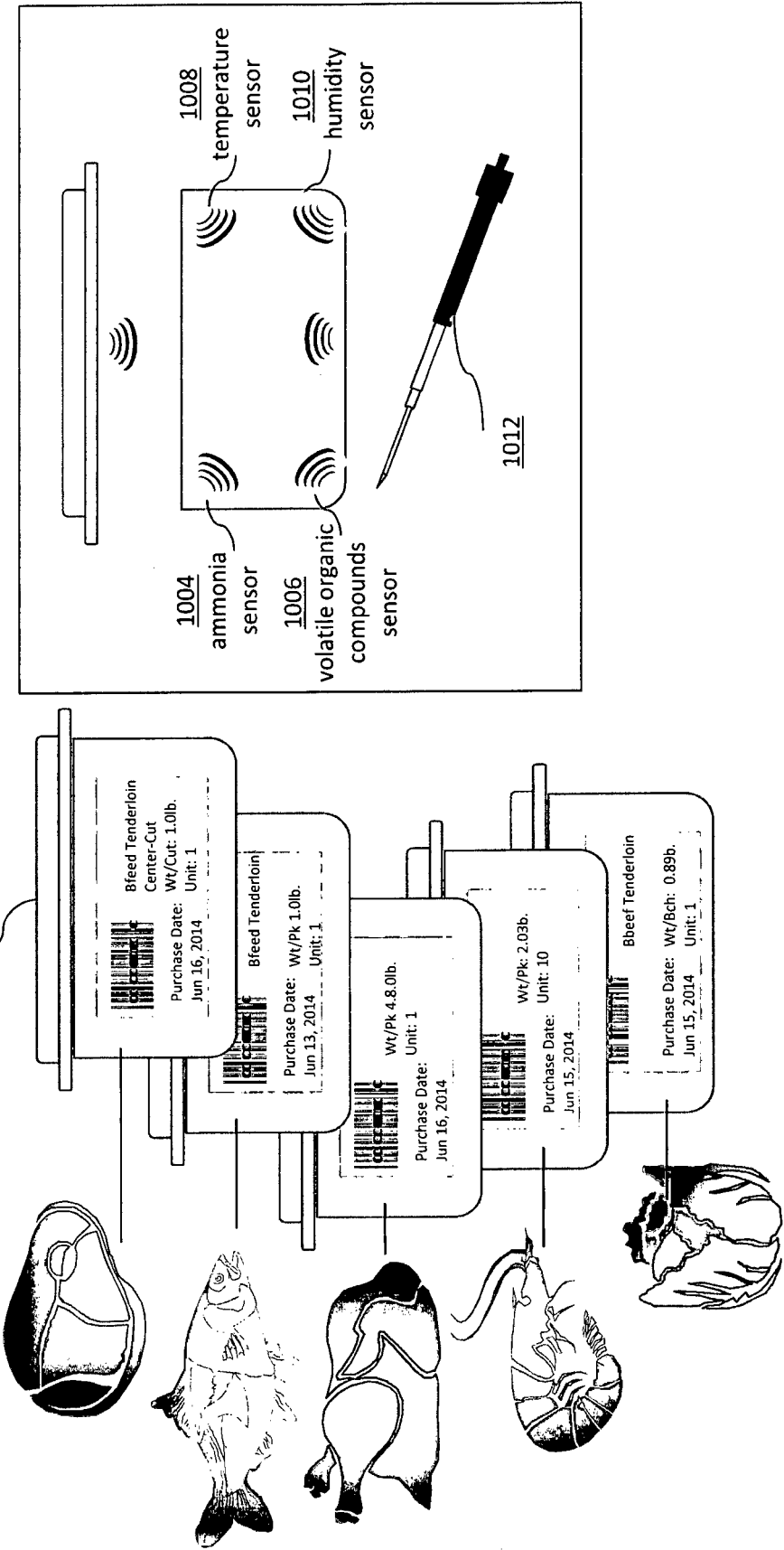
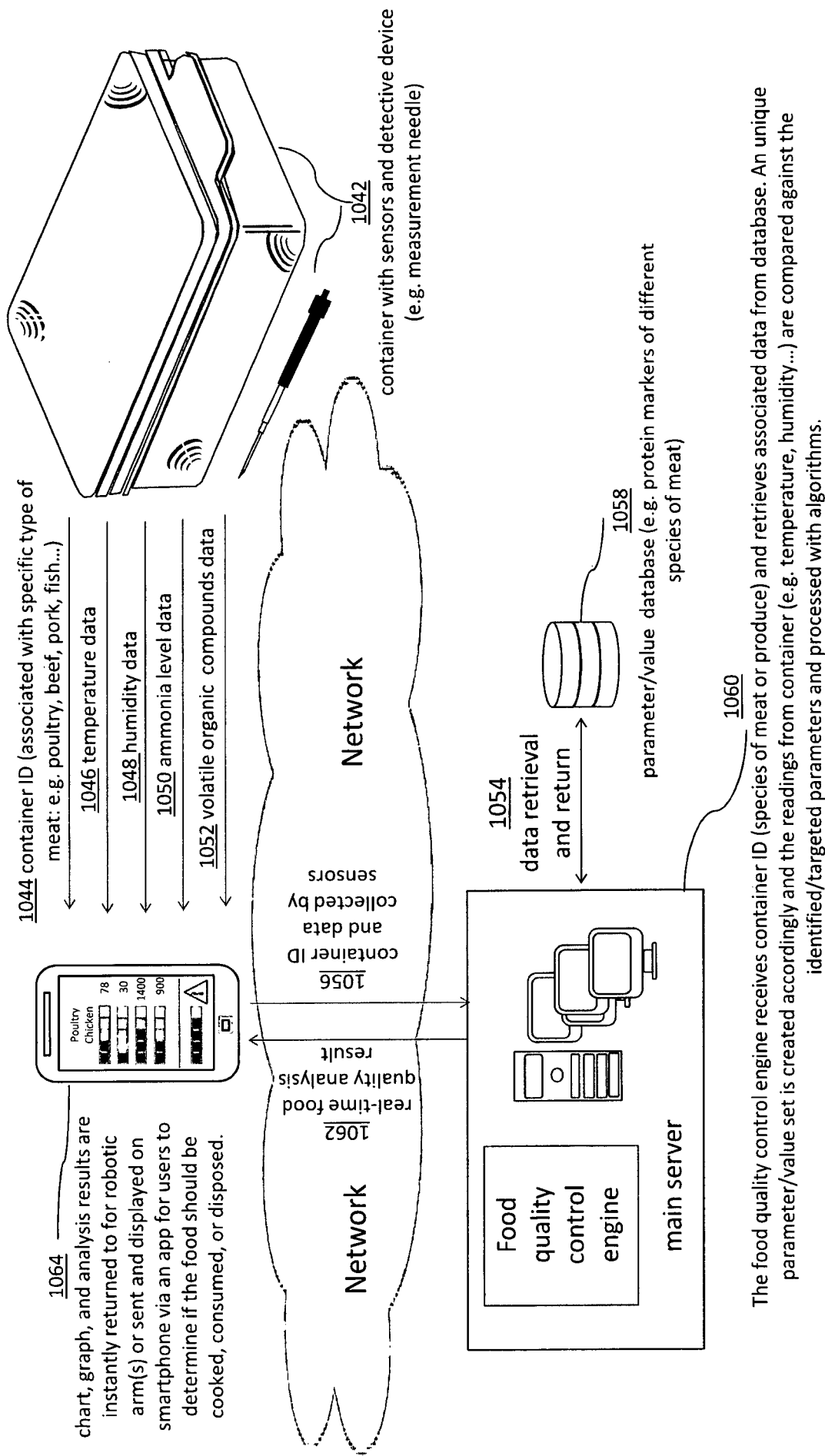
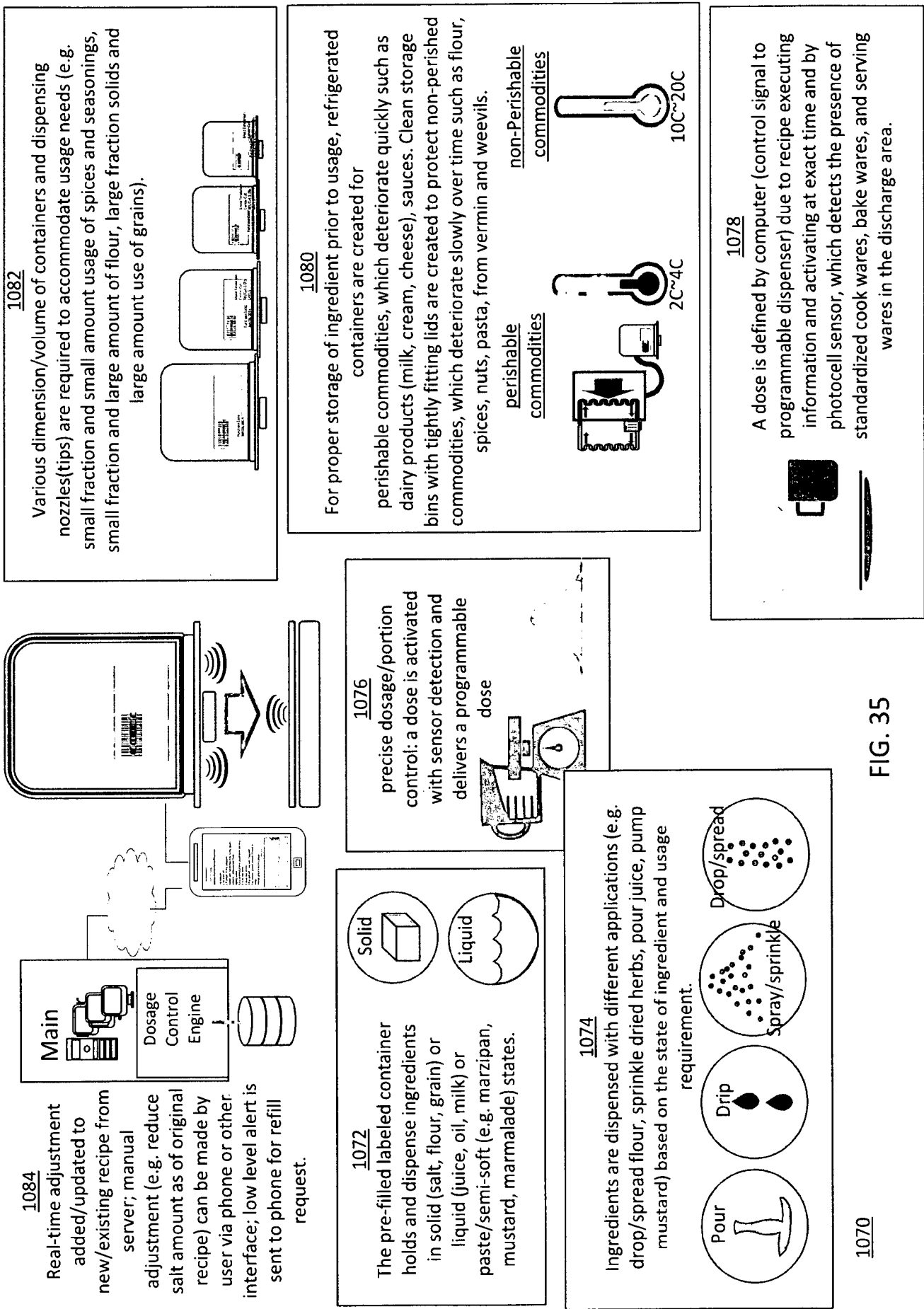


FIG. 33





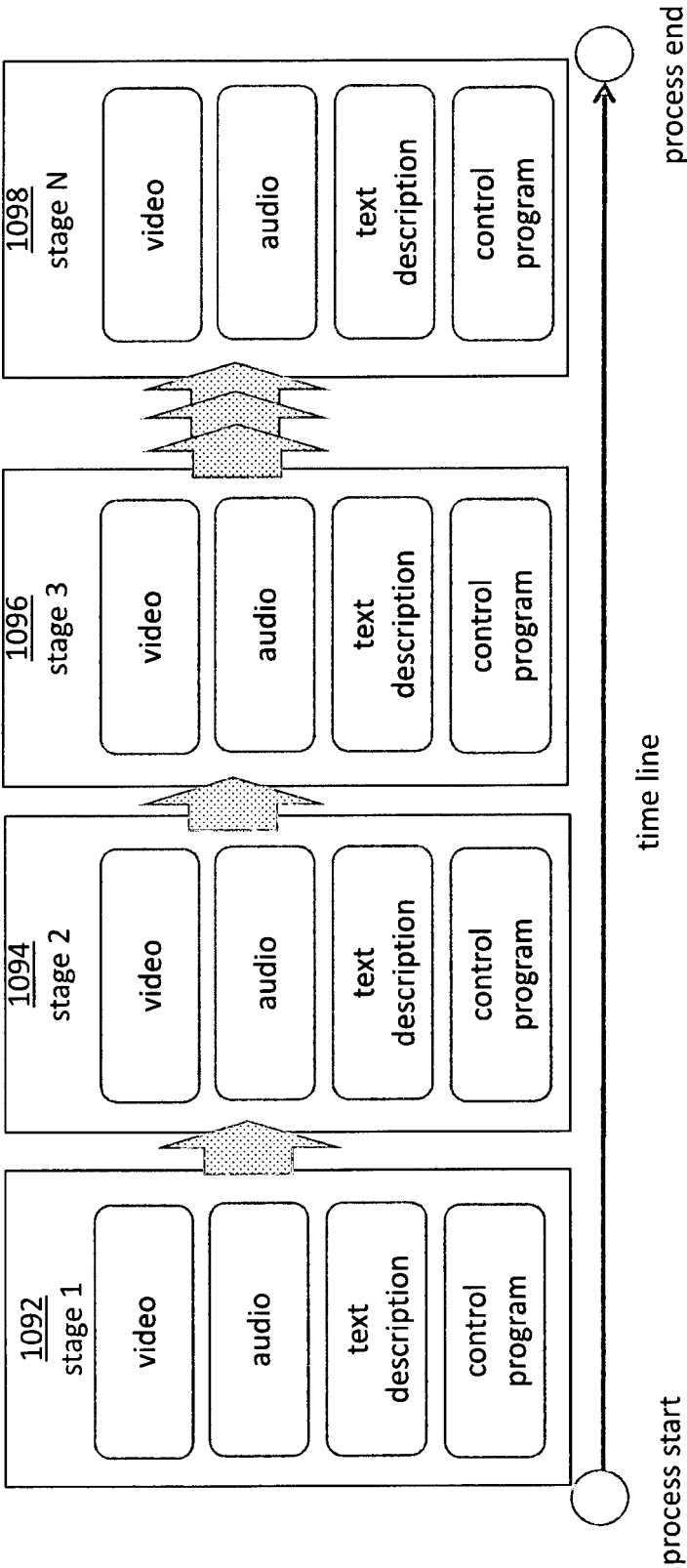
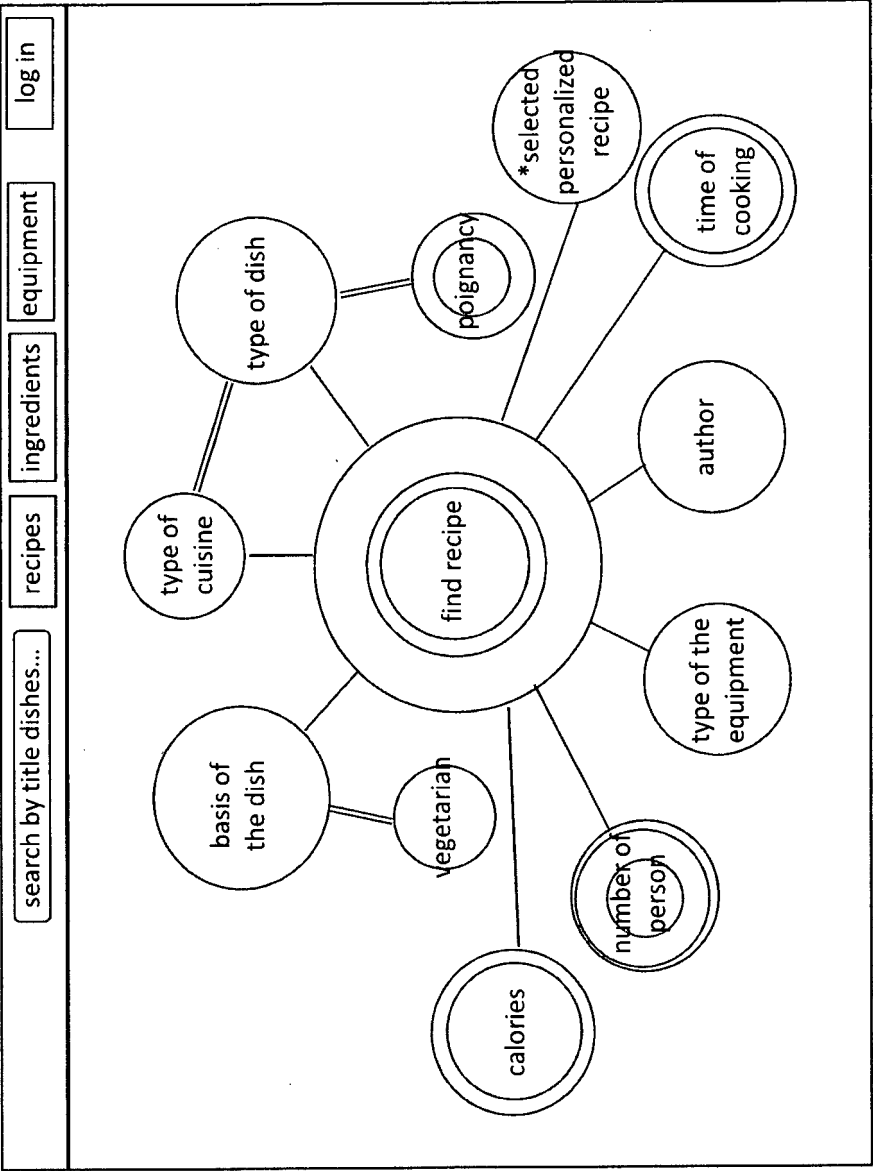
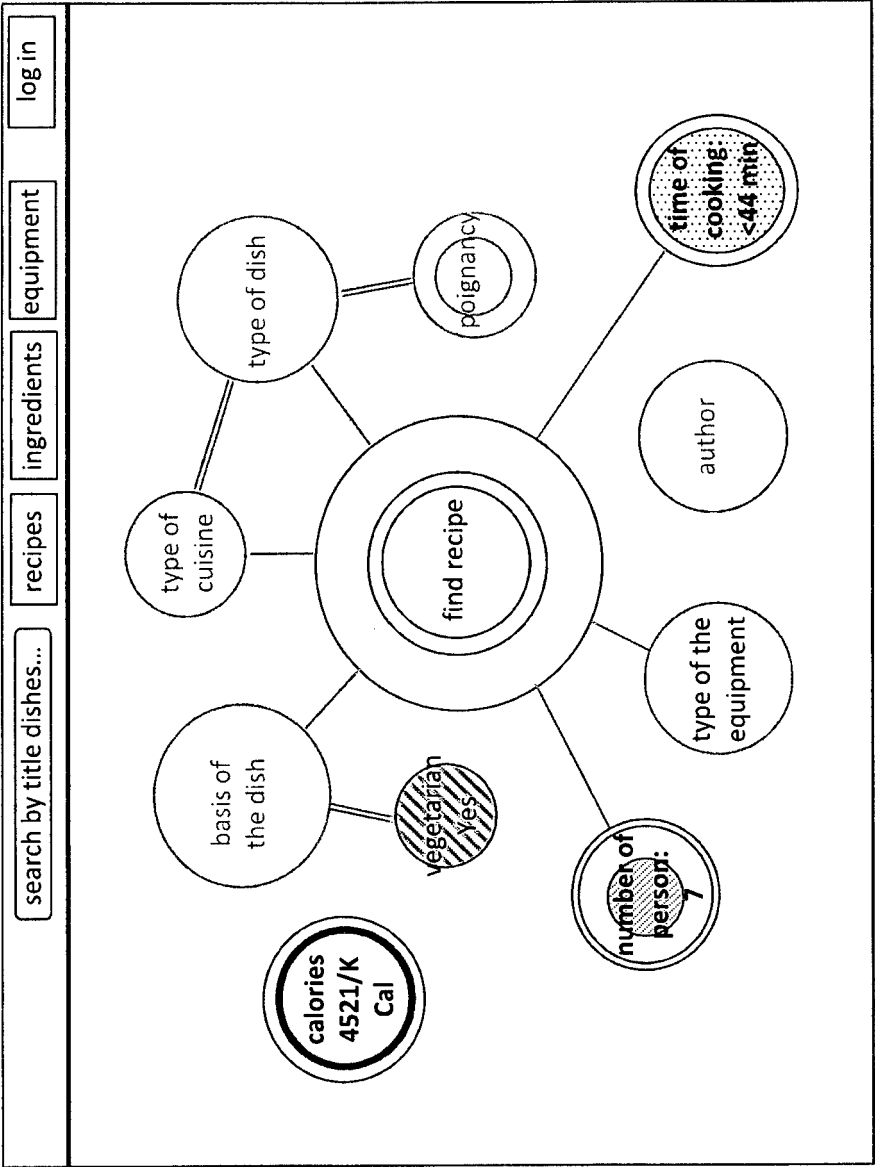


FIG. 36



1110

FIG. 37A



1110

FIG. 37B

1110

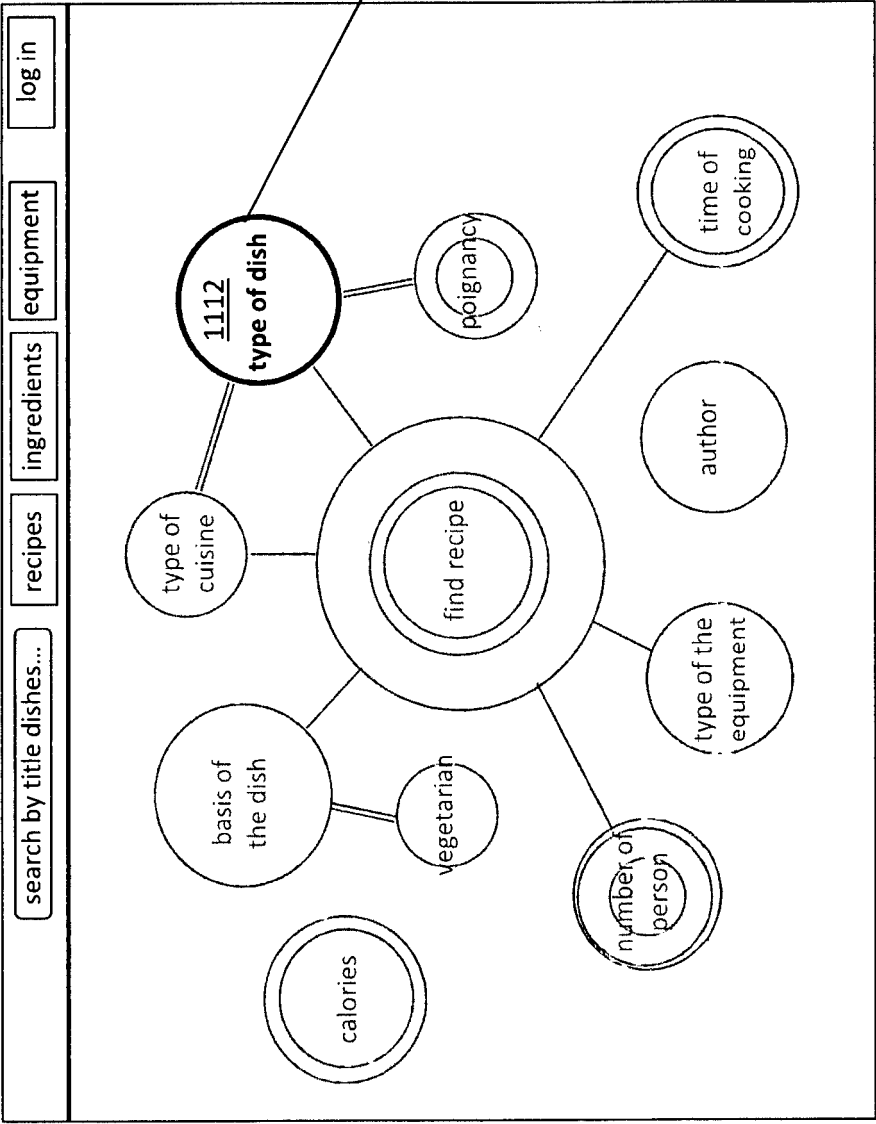


FIG. 37C



FIG. 37D

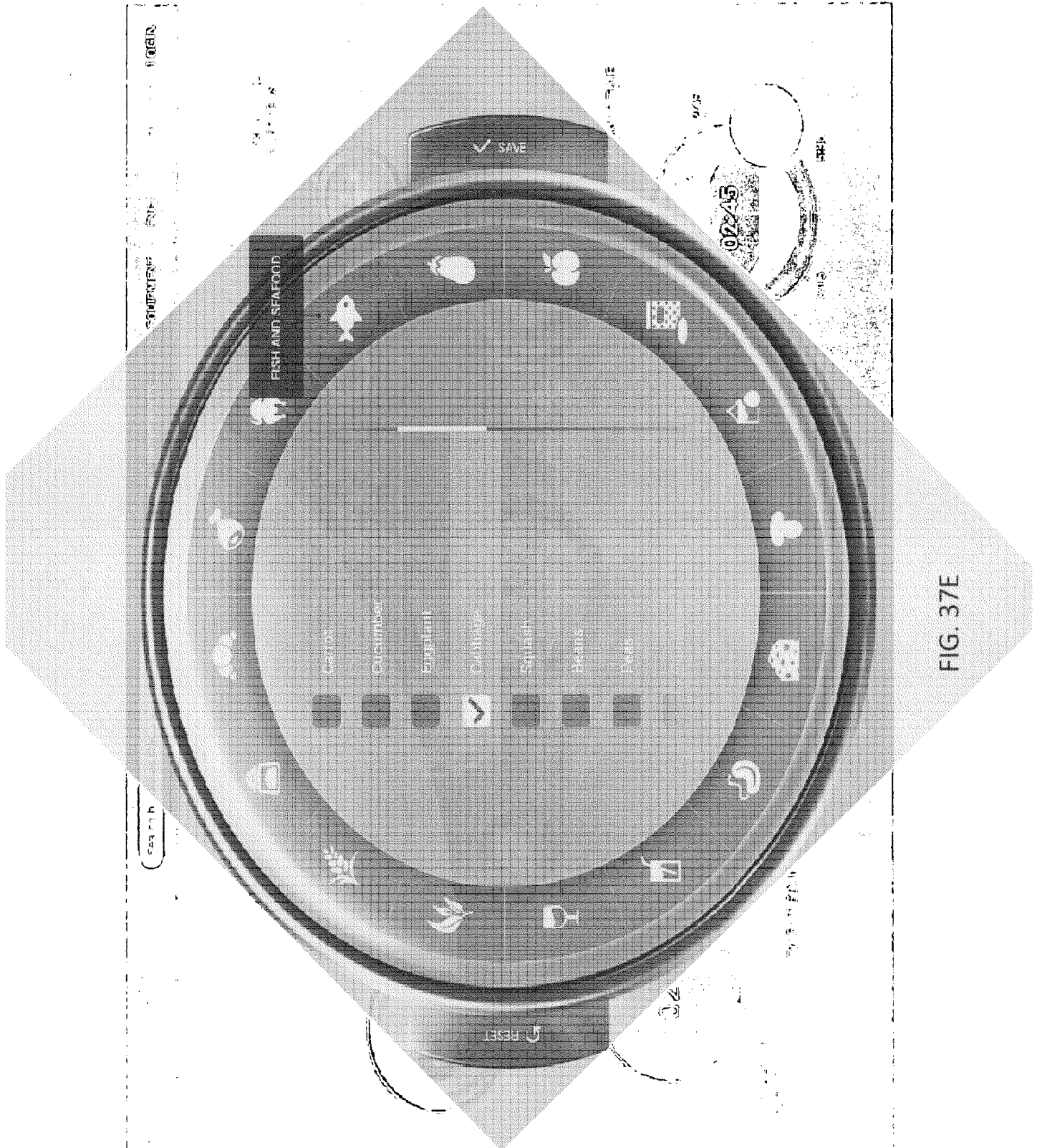
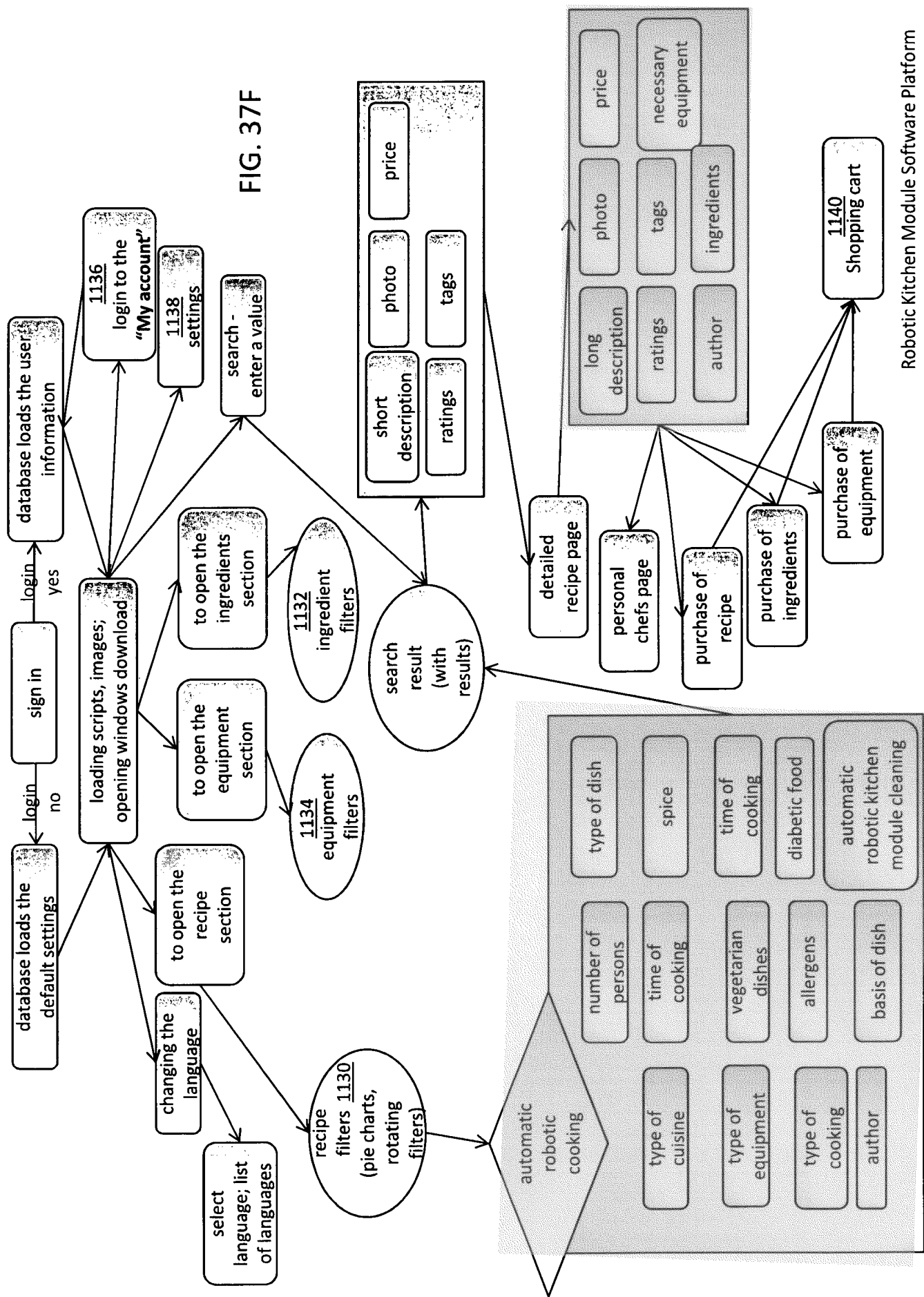
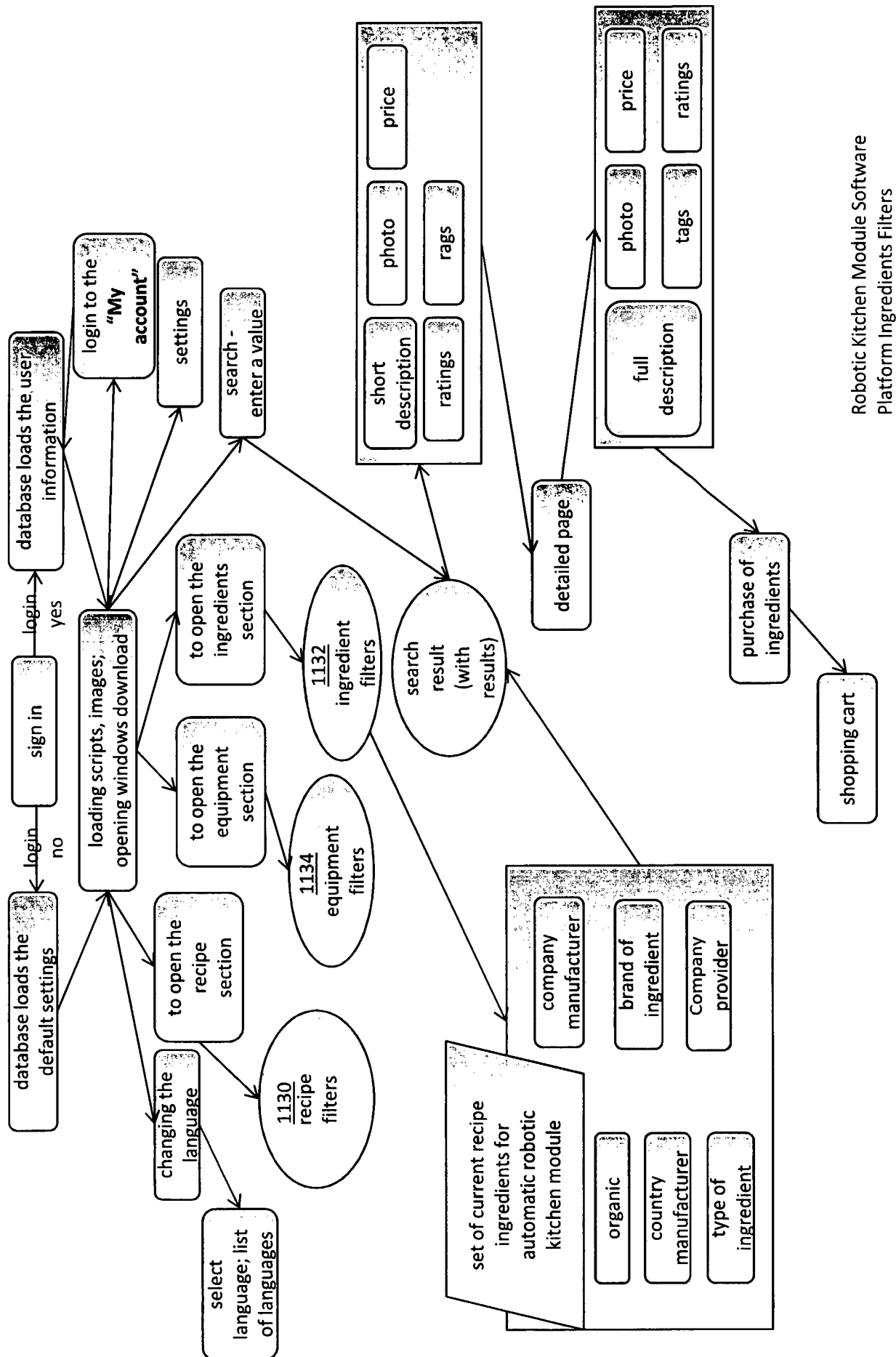


FIG. 37E





Robotic Kitchen Module Software
Platform Ingredients Filters

FIG. 37G

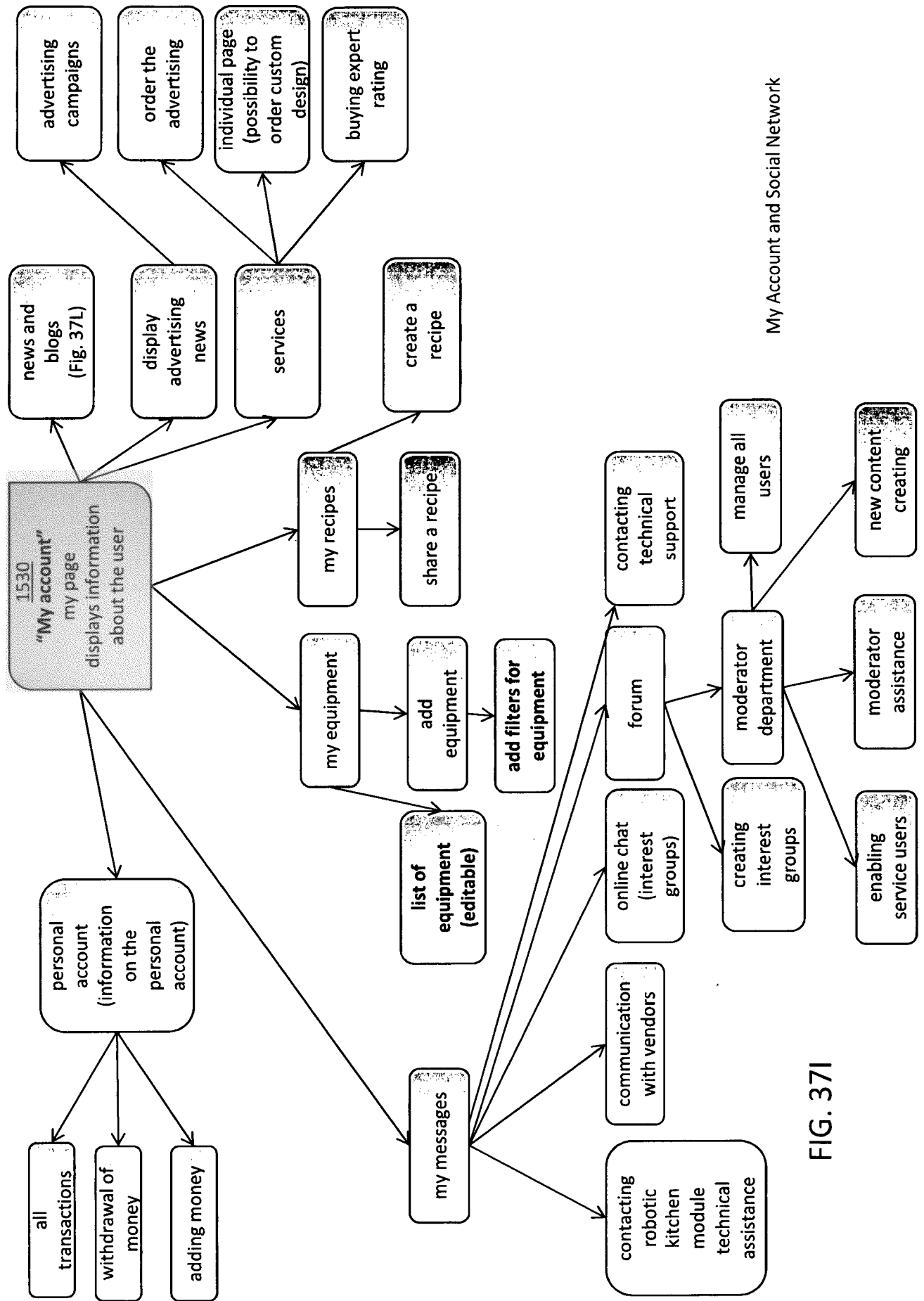


FIG. 37I

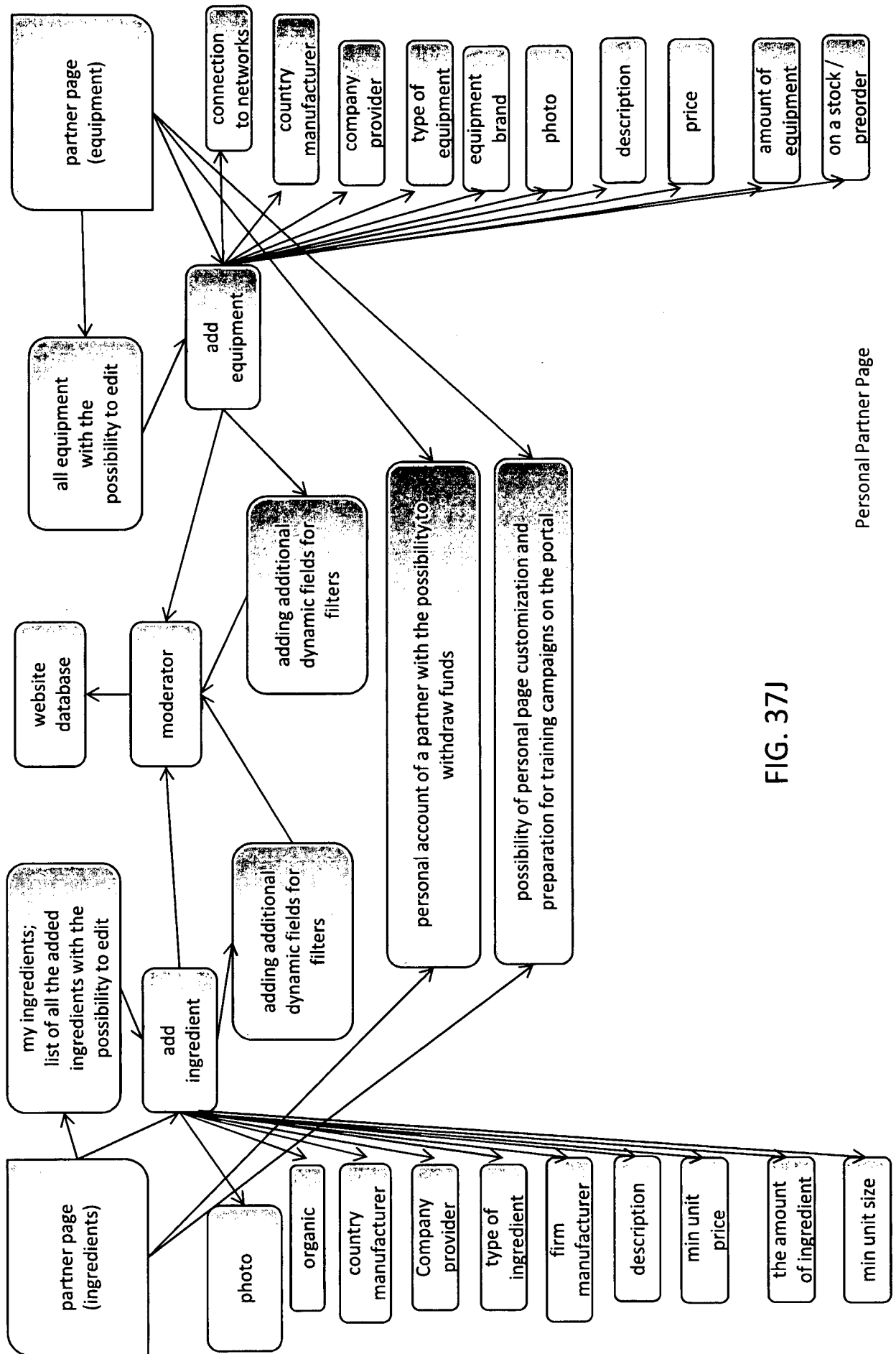


FIG. 37J

Personal Partner Page

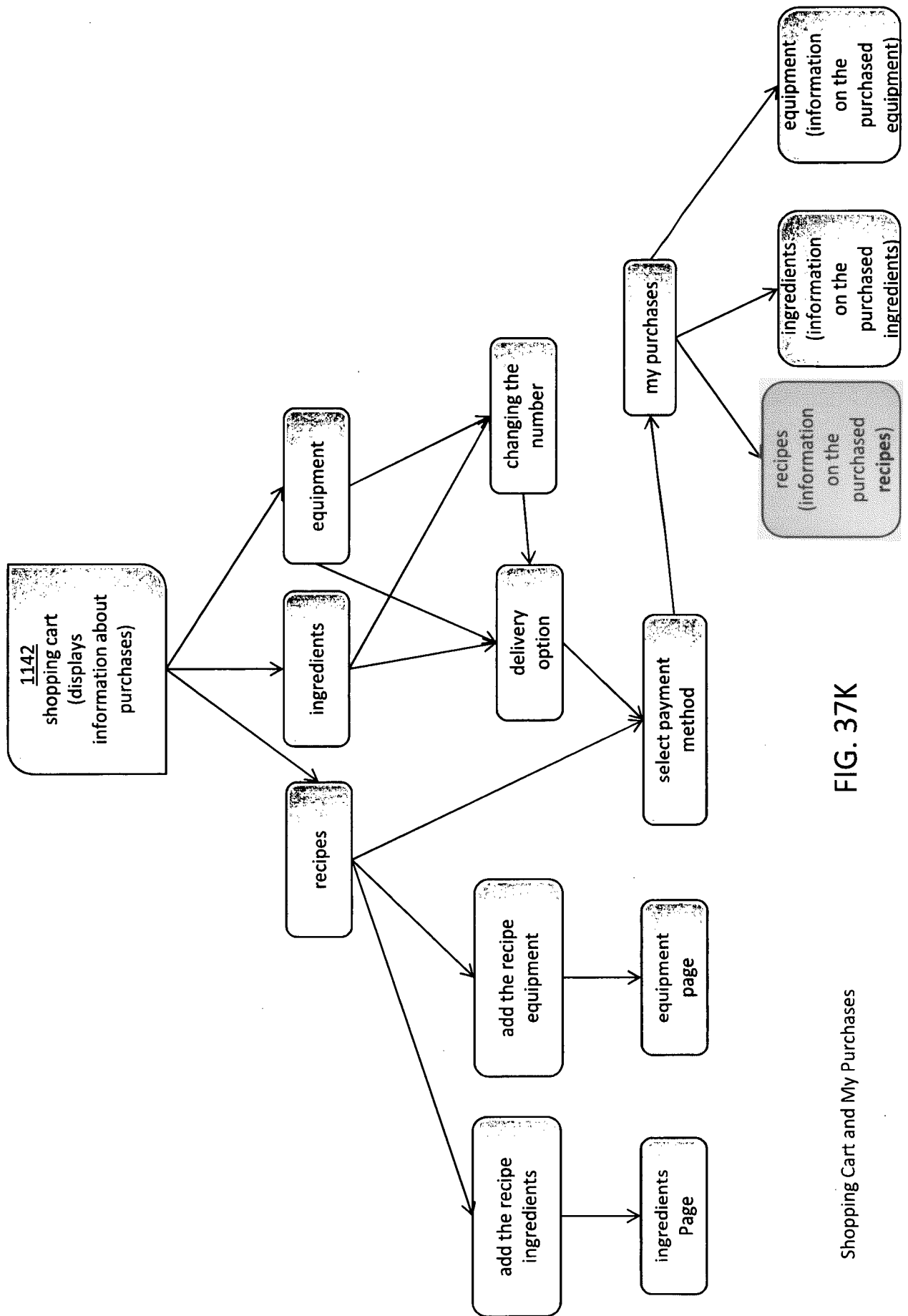


FIG. 37K

Shopping Cart and My Purchases

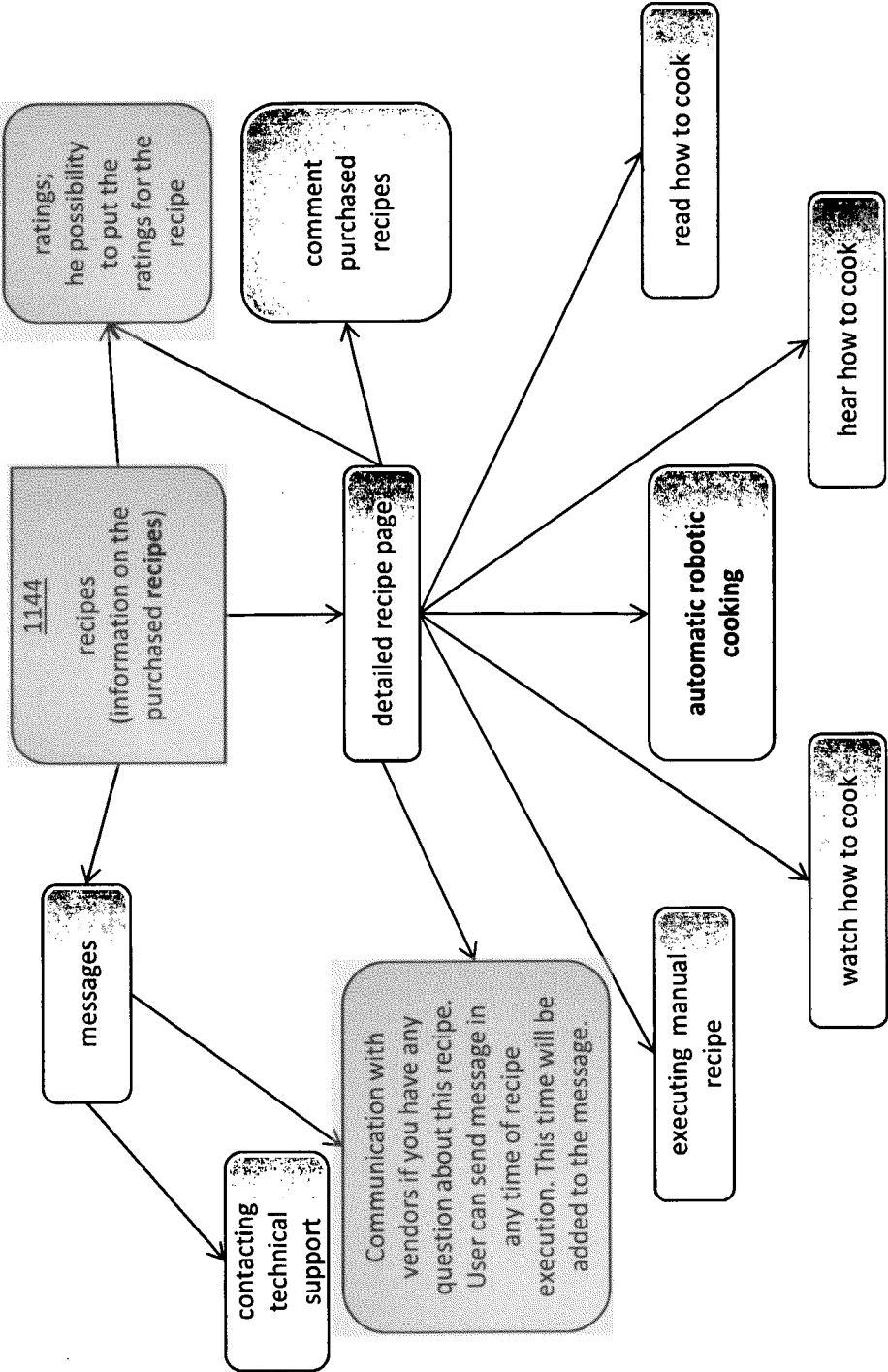
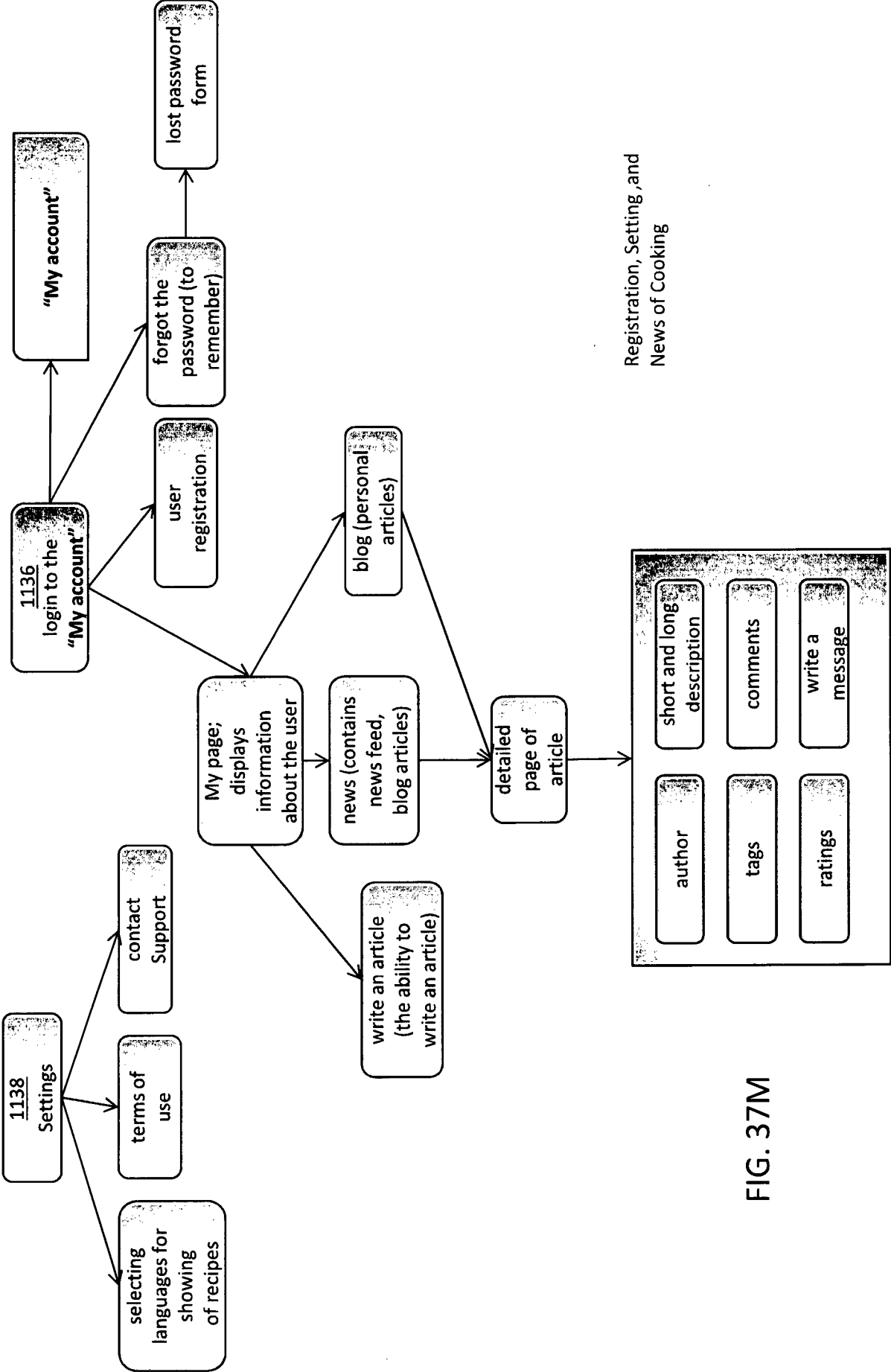


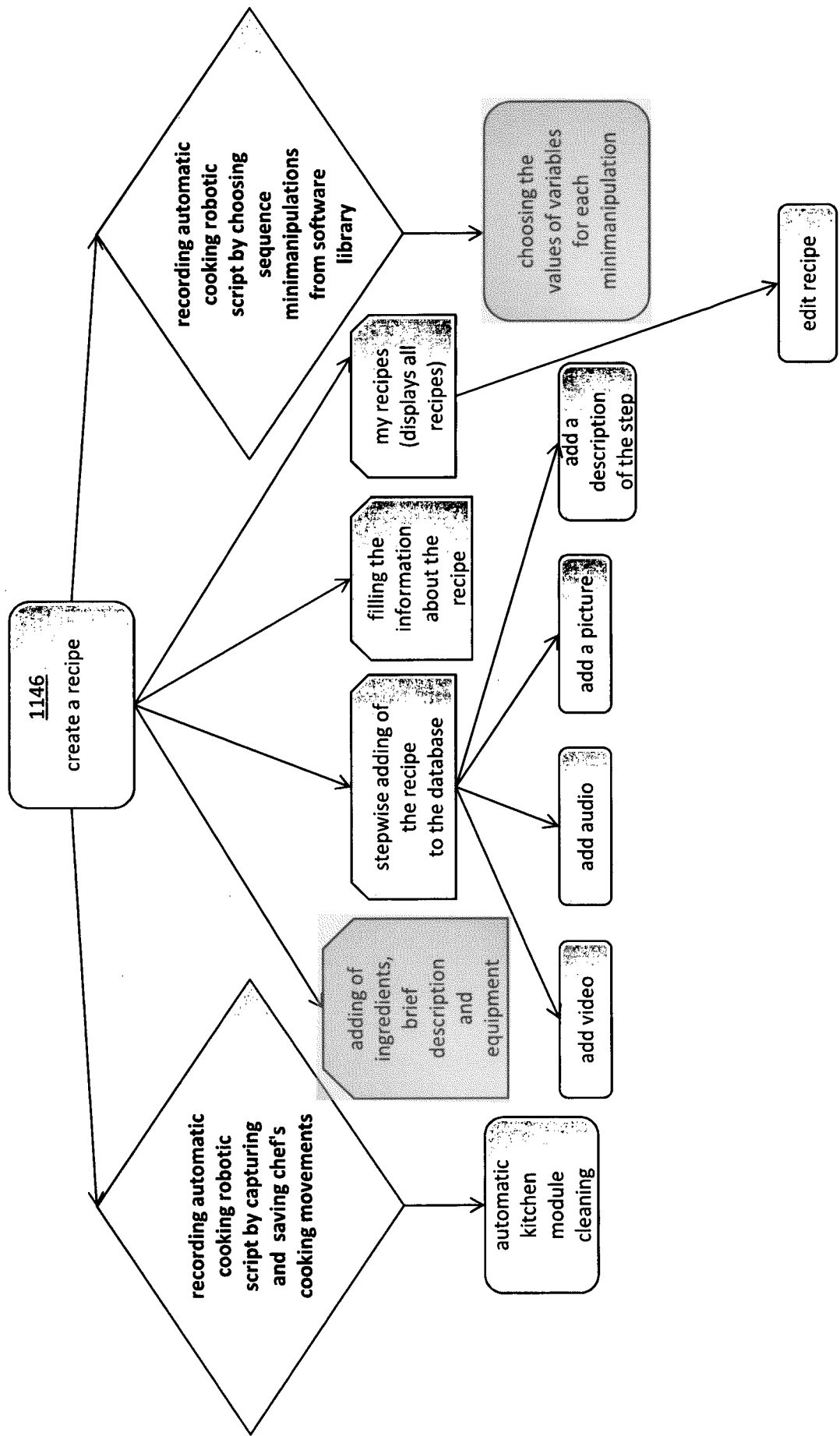
FIG. 37L

Information on the
Purchased **Recipes**



Registration, Setting, and
News of Cooking

FIG. 37M



Create A Recipe

FIG. 37N

Search by title dishes...

recipes

ingredients

equipment

Log in

type of cuisine

Click to select...

type of dish

Click to select...

basis of the dish

Click to select...

poignancy

☐ ☐ ☐ ☐ ☐

vegetarian

☒ yes

calories

☐

time of cooking

☐

Number of person

☐

type of the equipment

Click to select...

author

Click to select...

user rating

expert rating

purchase rating

price

time of cooking

author

Log in

Log out

recipe display

recipe display

recipe display

recipe display

recipe display

recipe display

recipe display

recipe display

recipe display

photo/
media

recipe title
description

expert rating 0/5

user rating 0/5

Read more

shopping cart

price

purchase rating 0/5

1150

FIG. 38

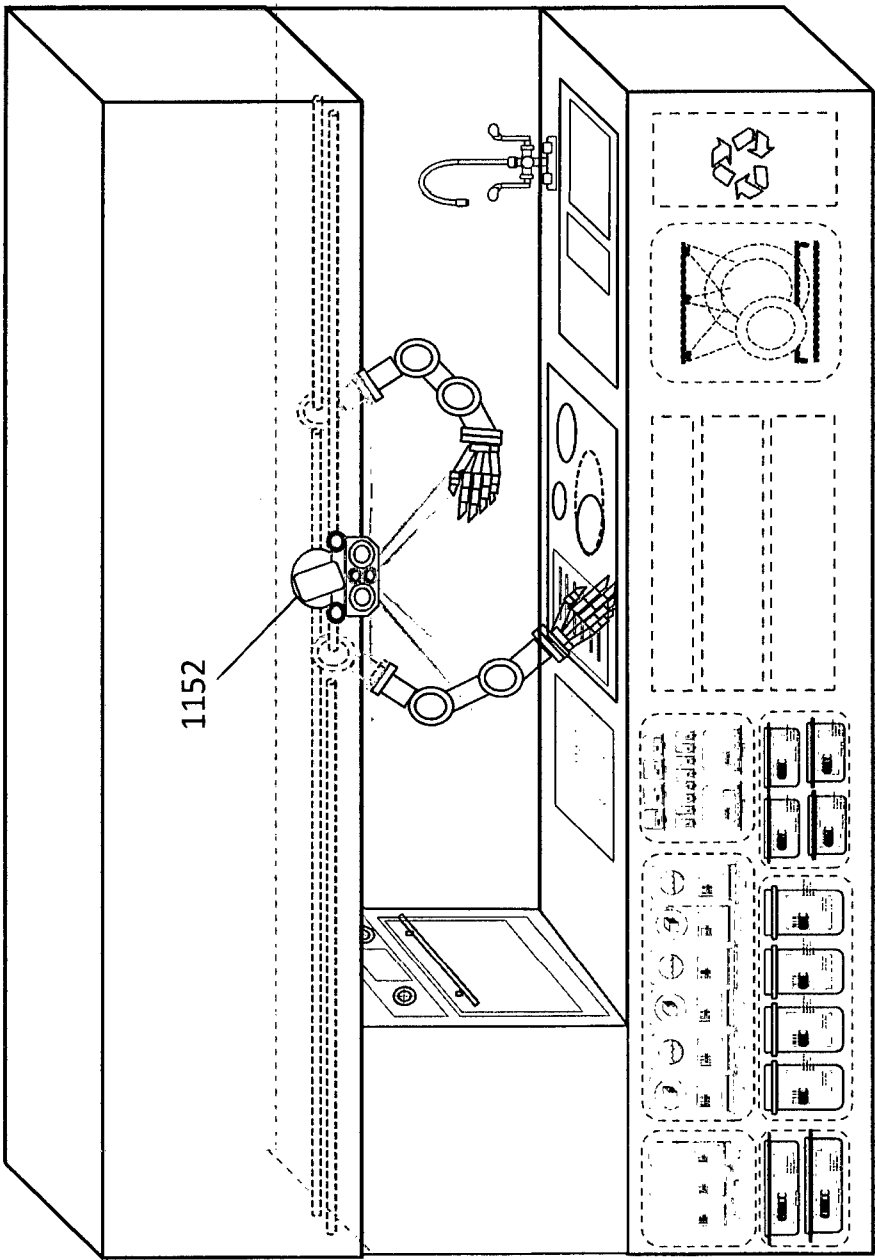
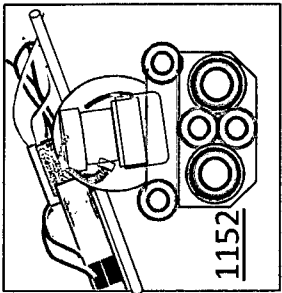


FIG. 39

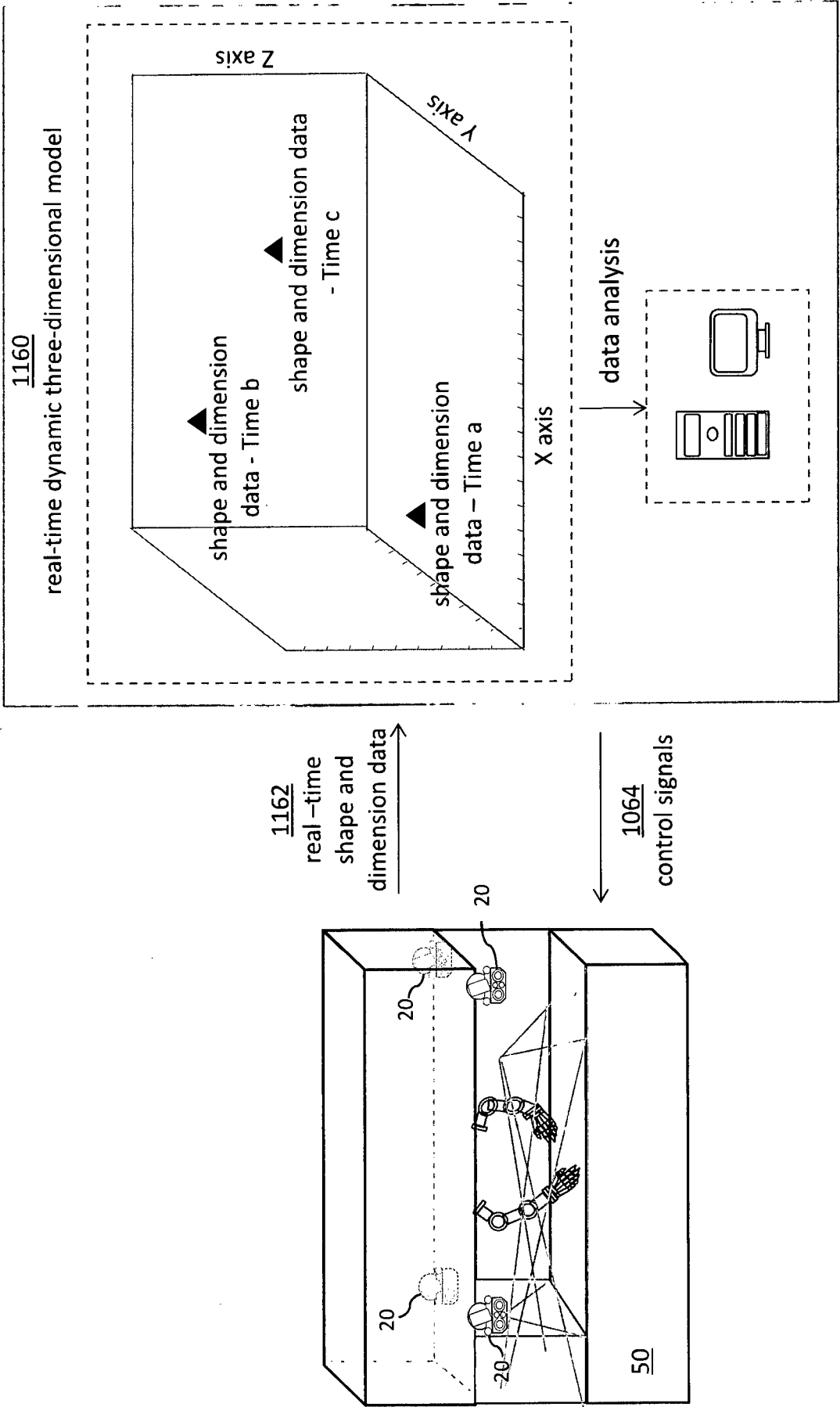


FIG. 40

1172
extractible hood in robot
mode for two robot arms,
return to charging dock
and store when not
cooking, or kitchen set
for food preparation in
manual mode

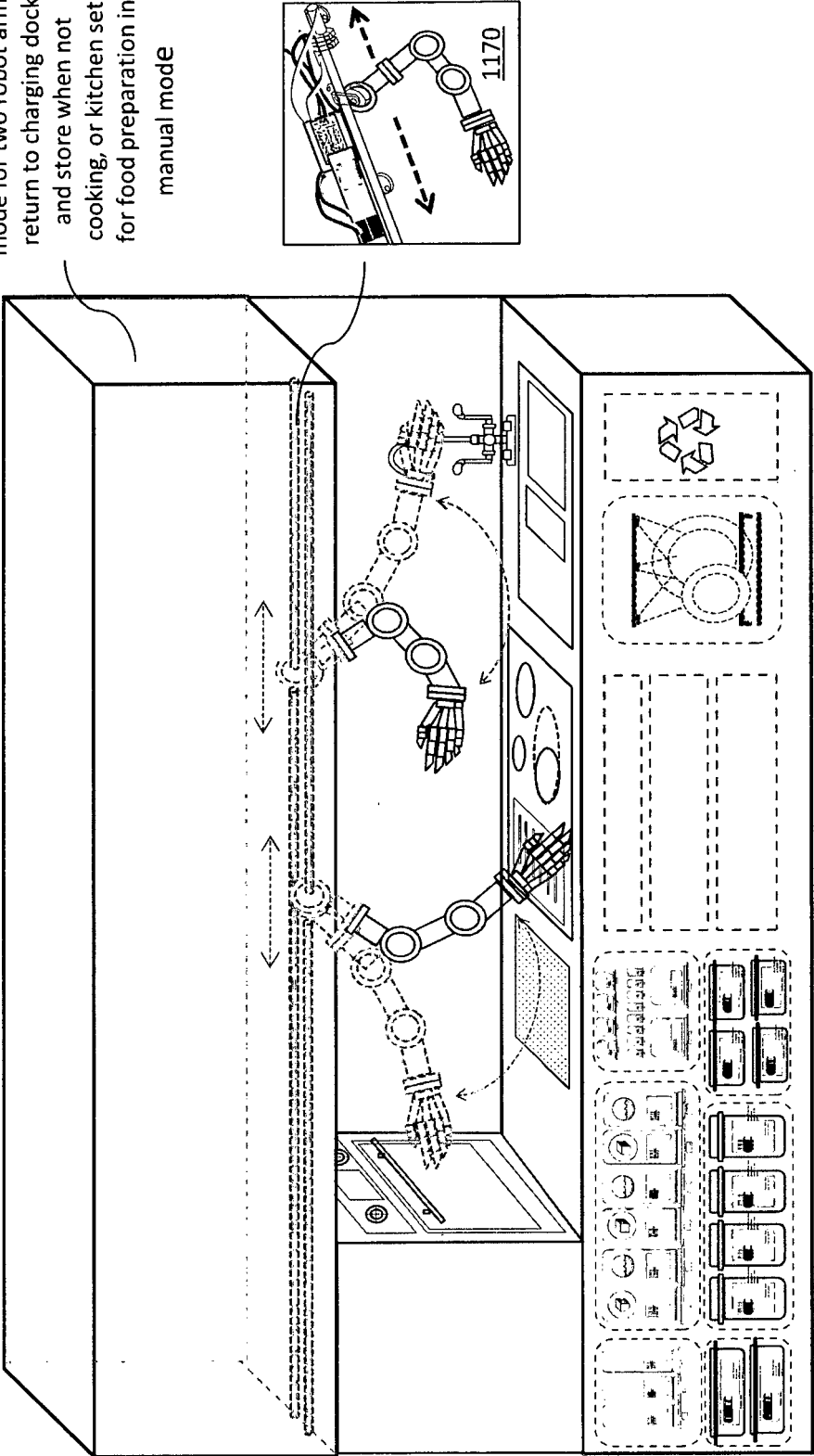


FIG. 41A

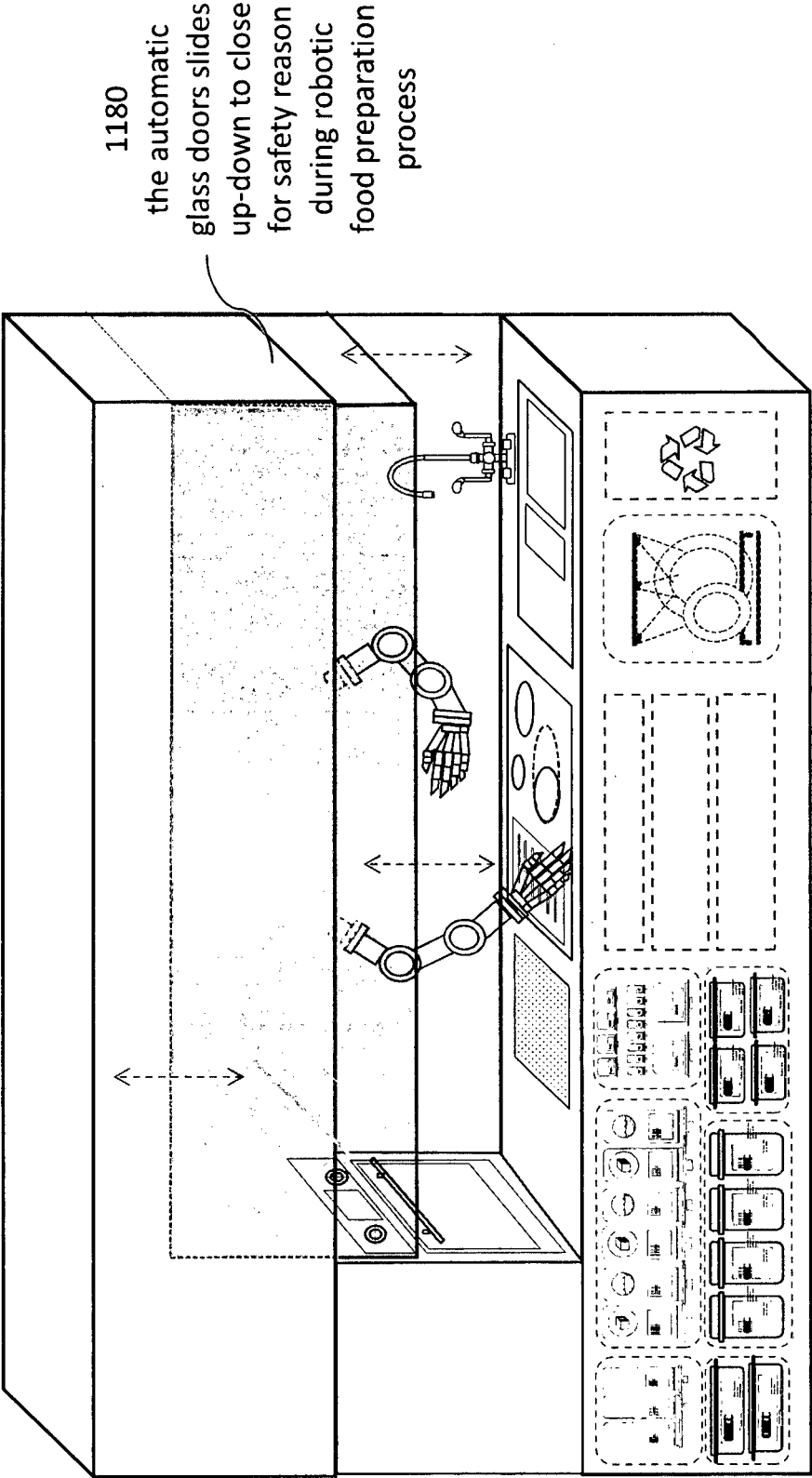


FIG. 41B

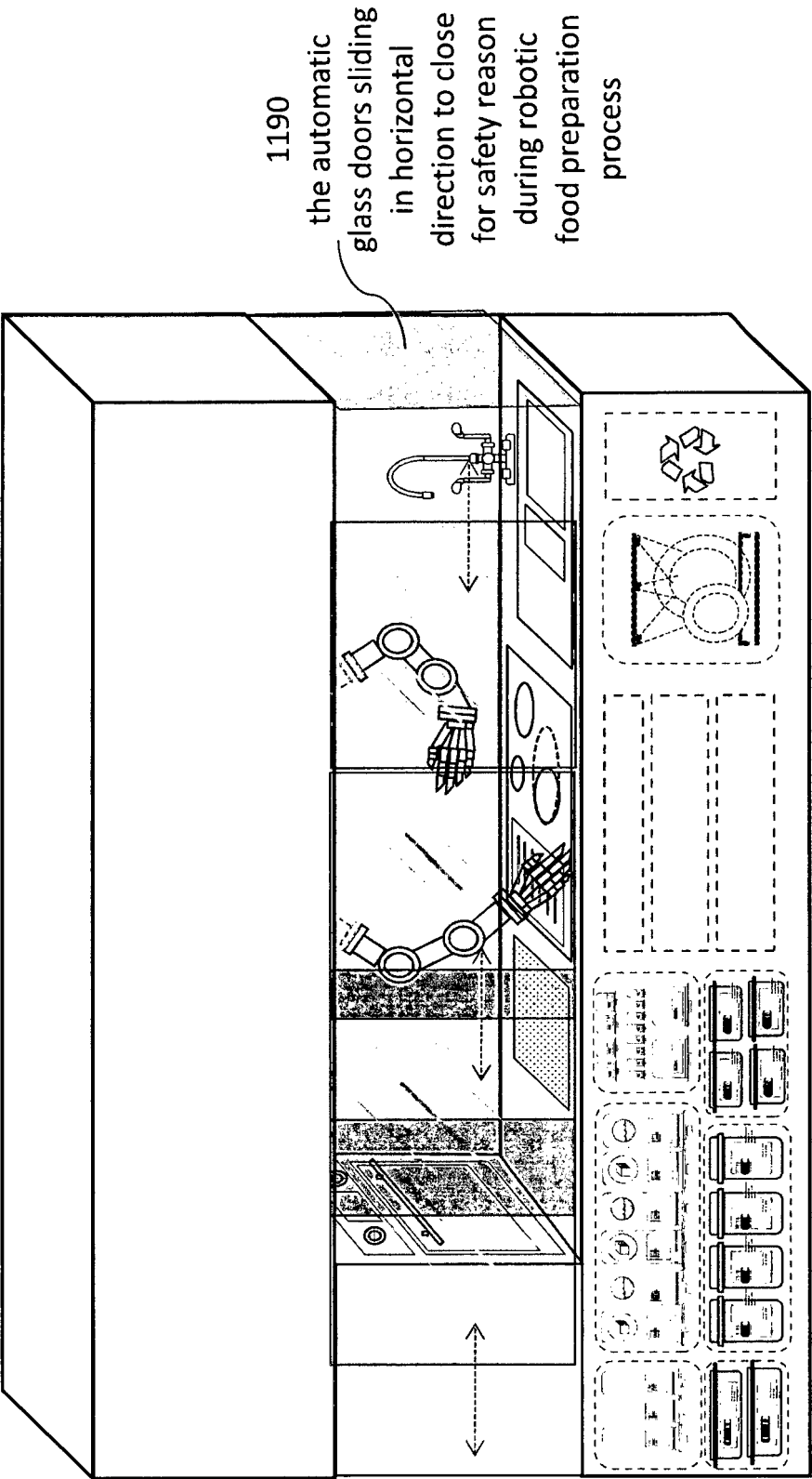


FIG. 41C

robotic kitchen prototype

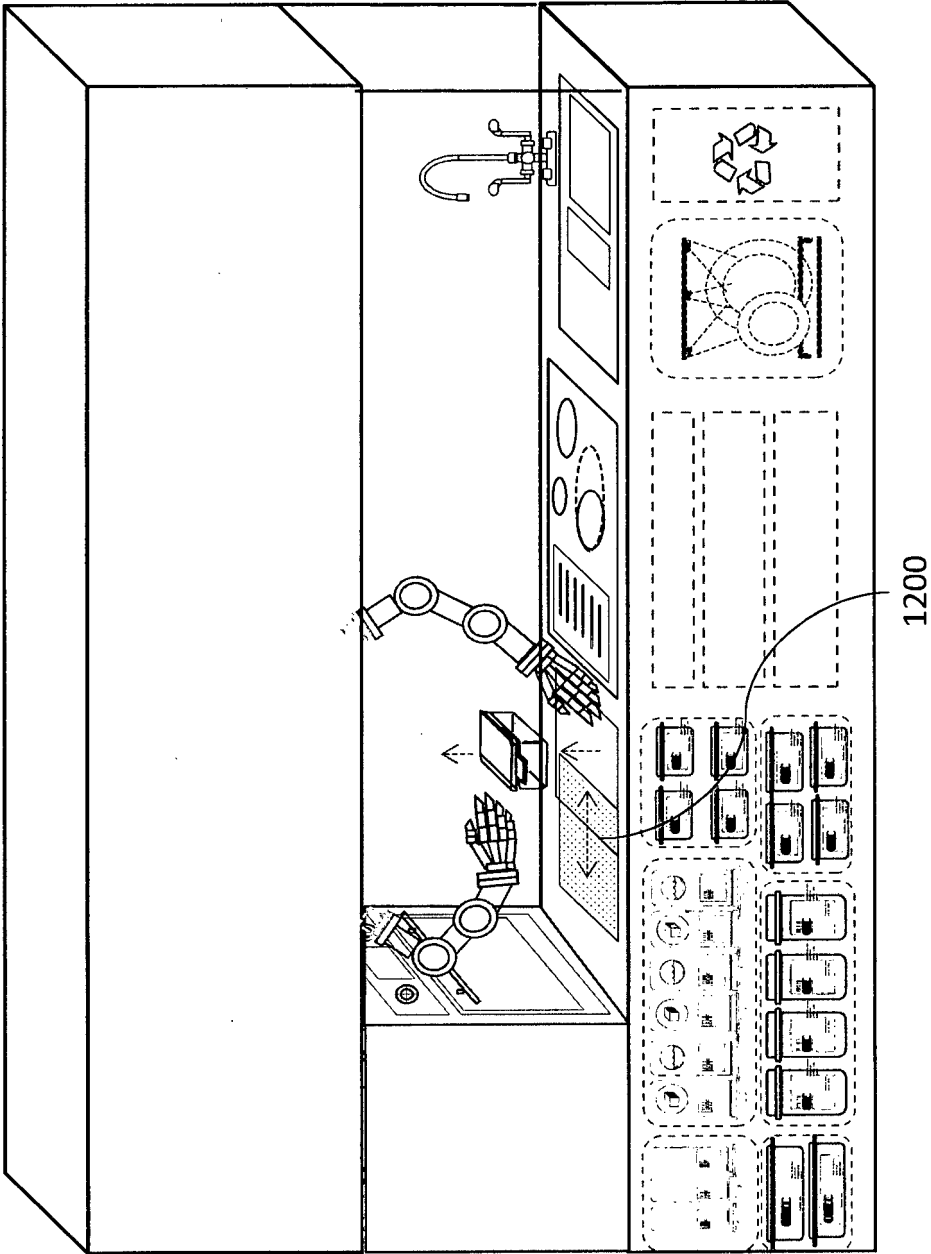


FIG. 41D

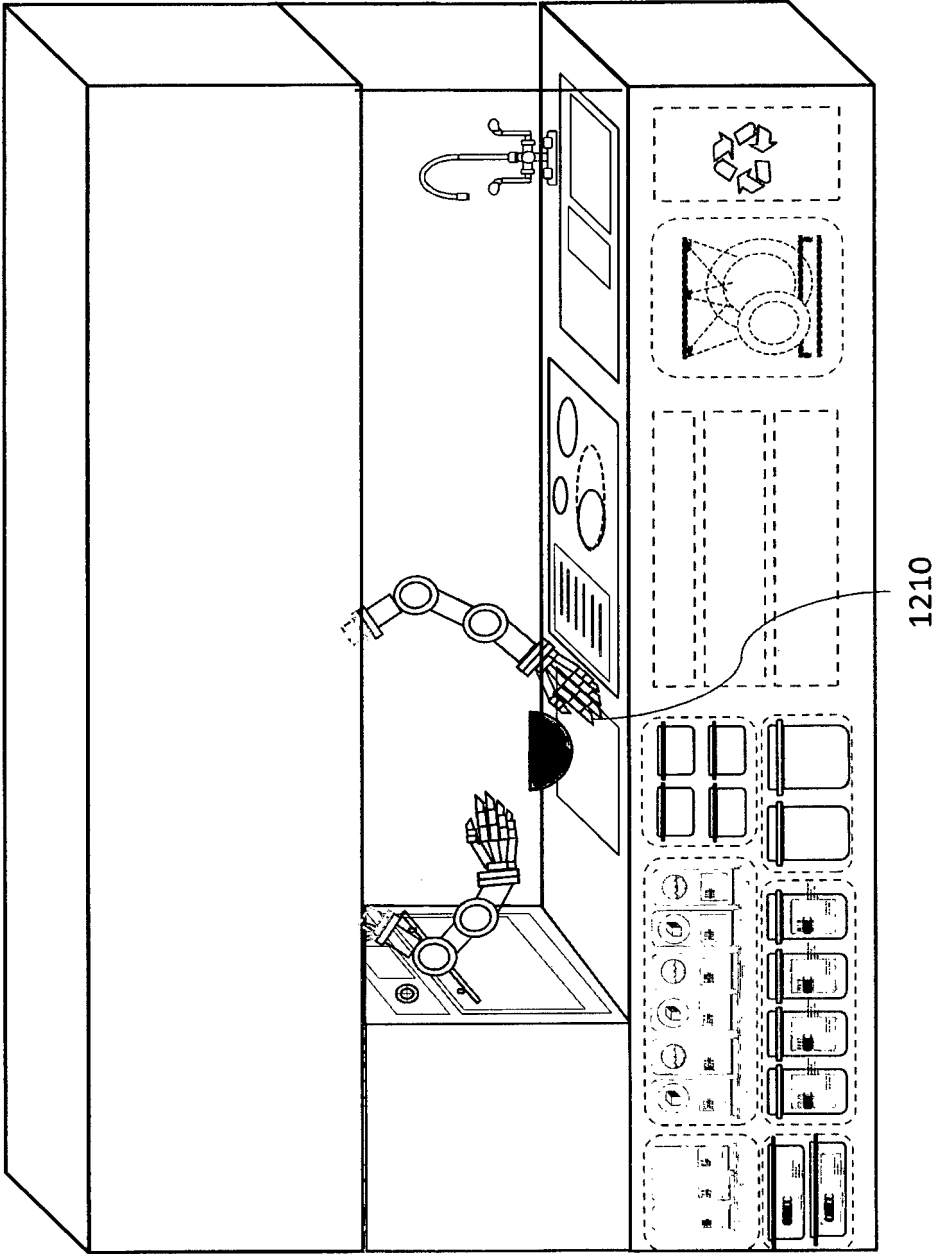


FIG. 41E

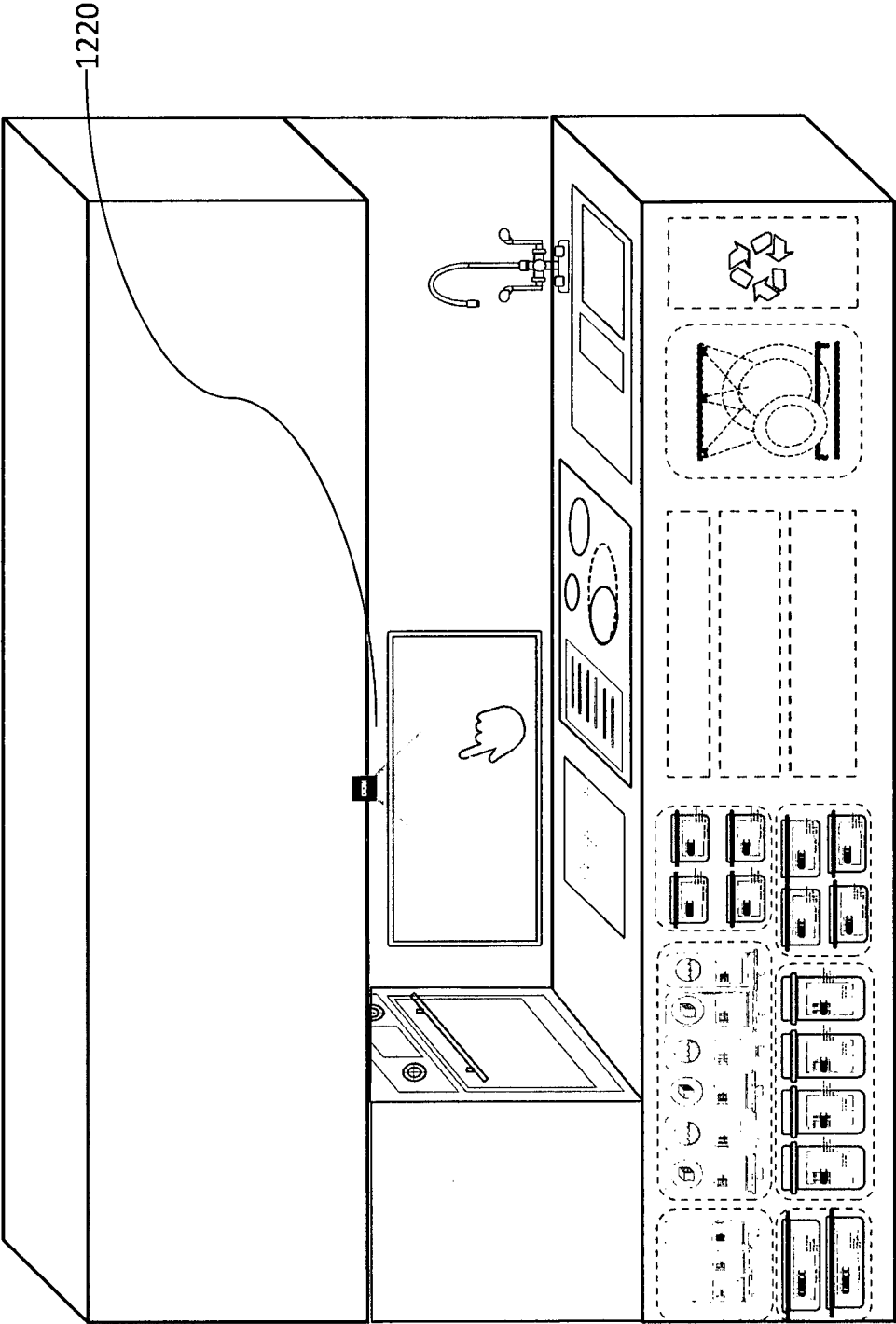
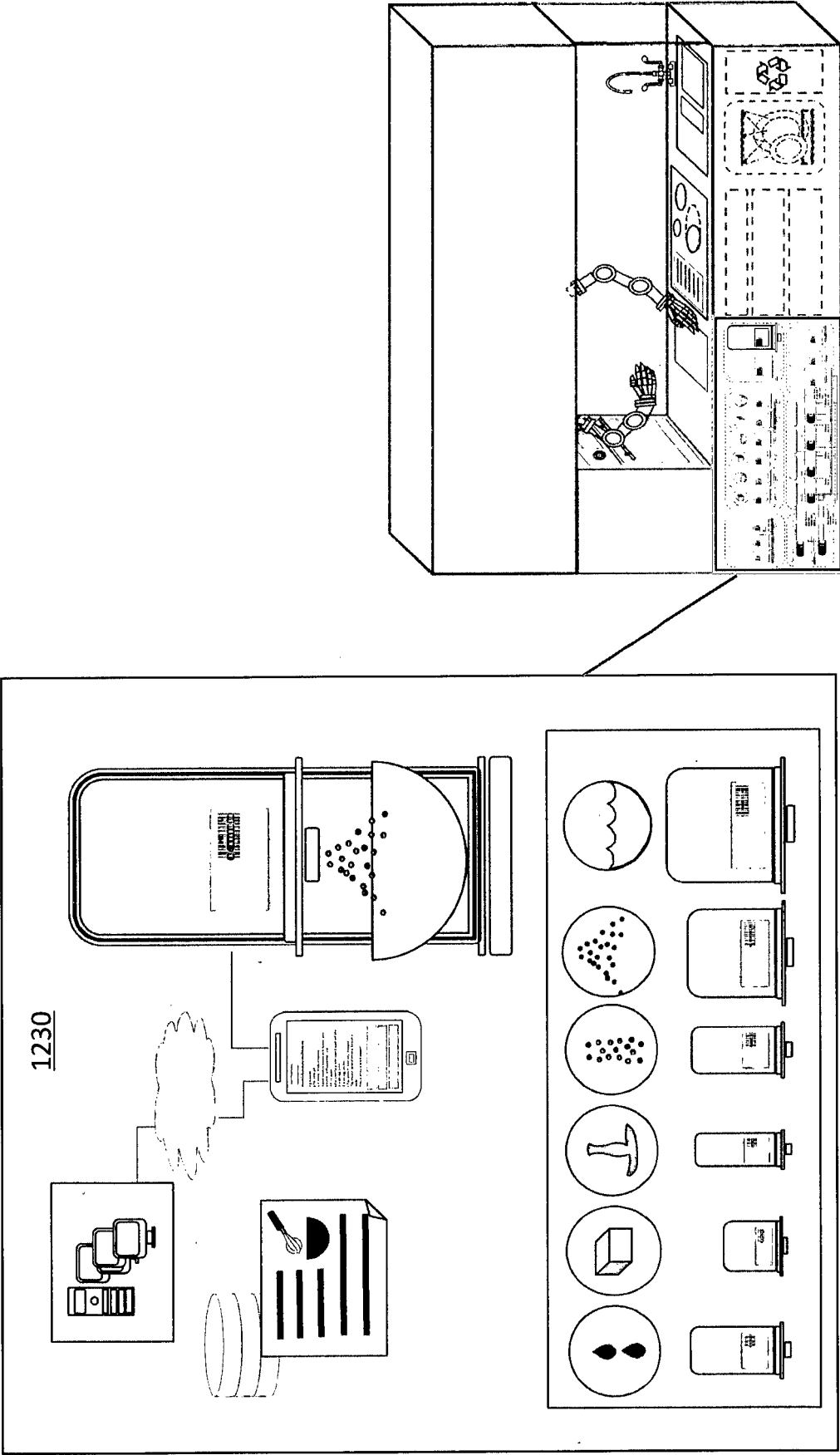


FIG. 41F



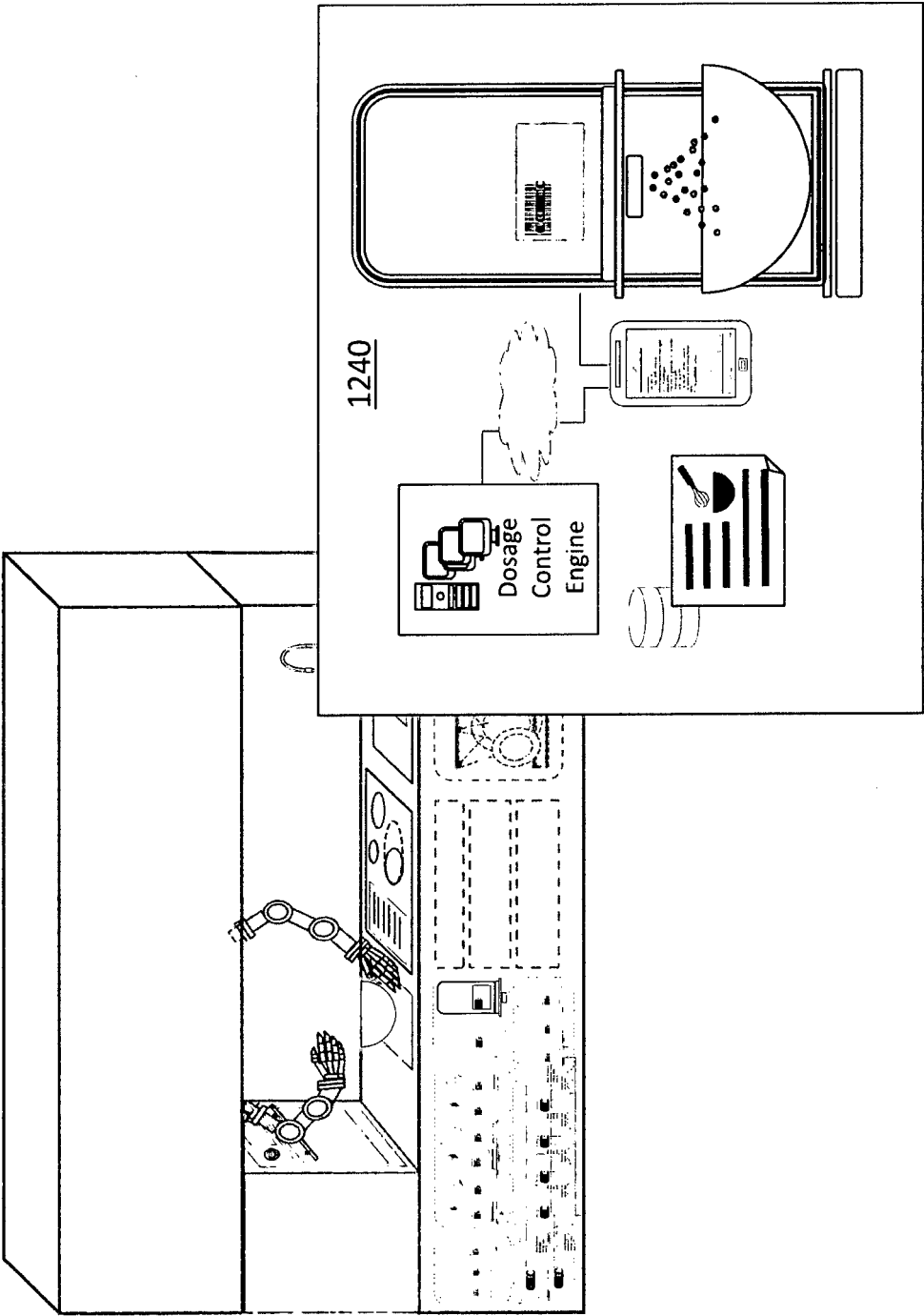


FIG. 41H

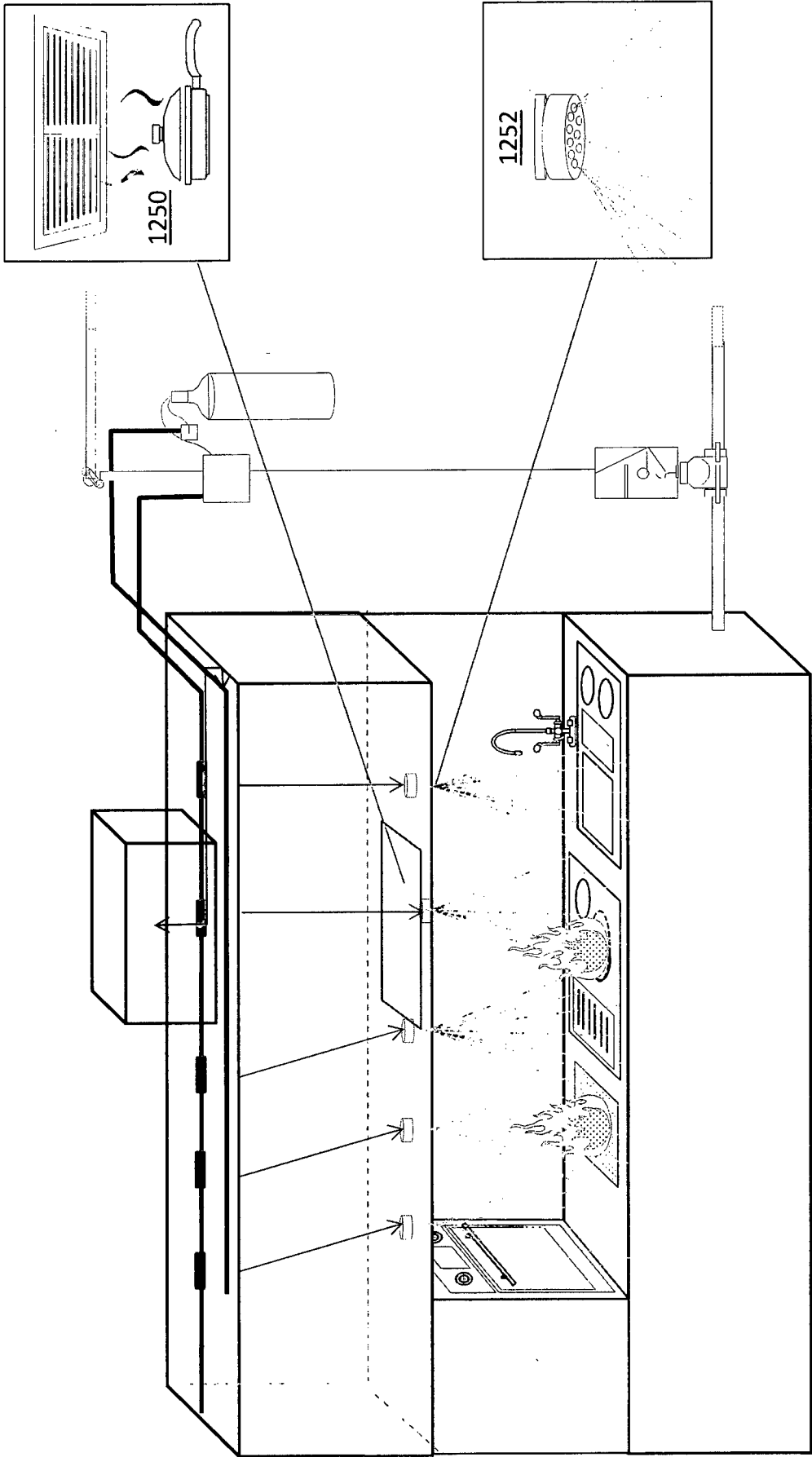


FIG. 41I

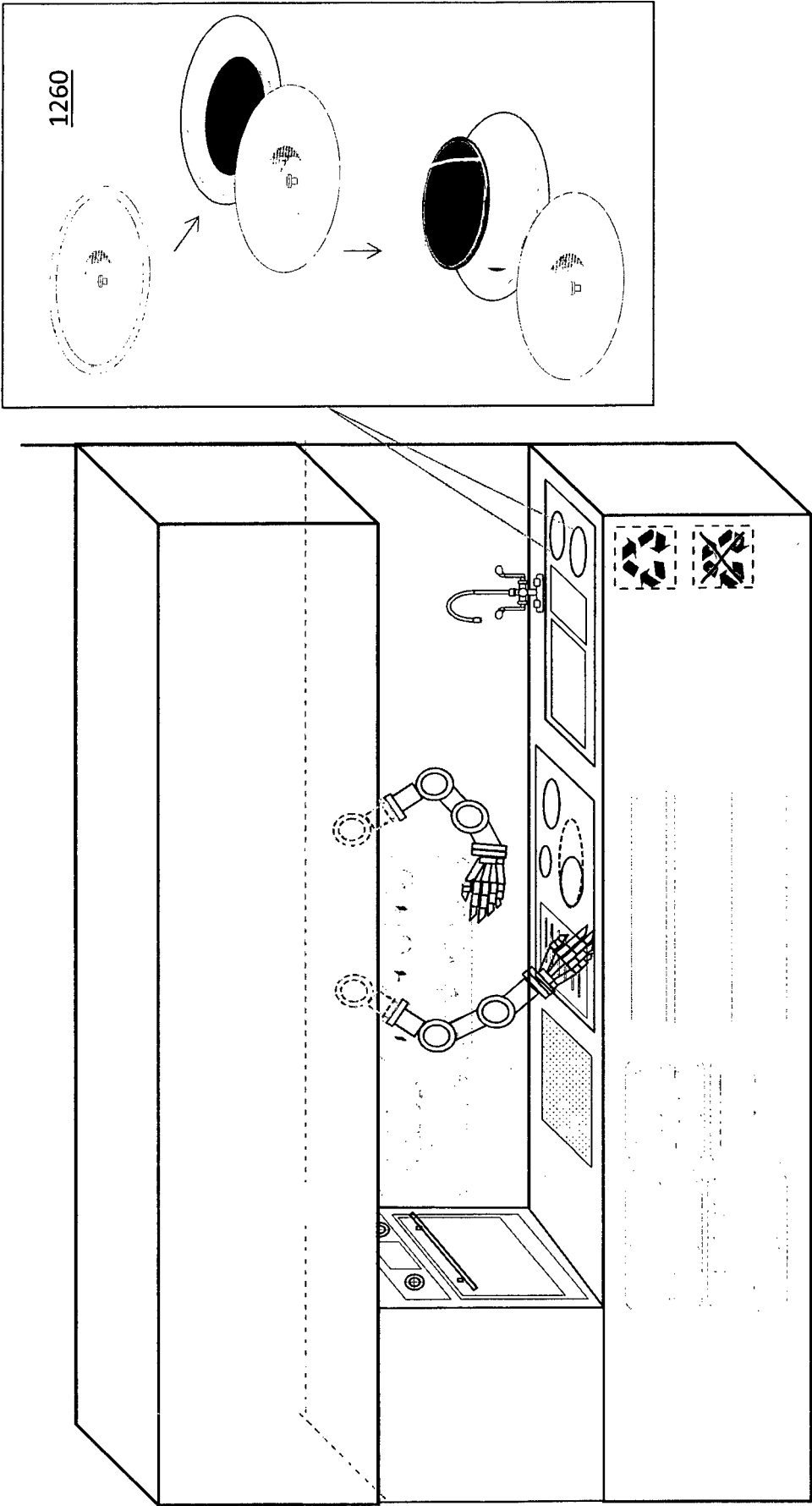


FIG. 41J

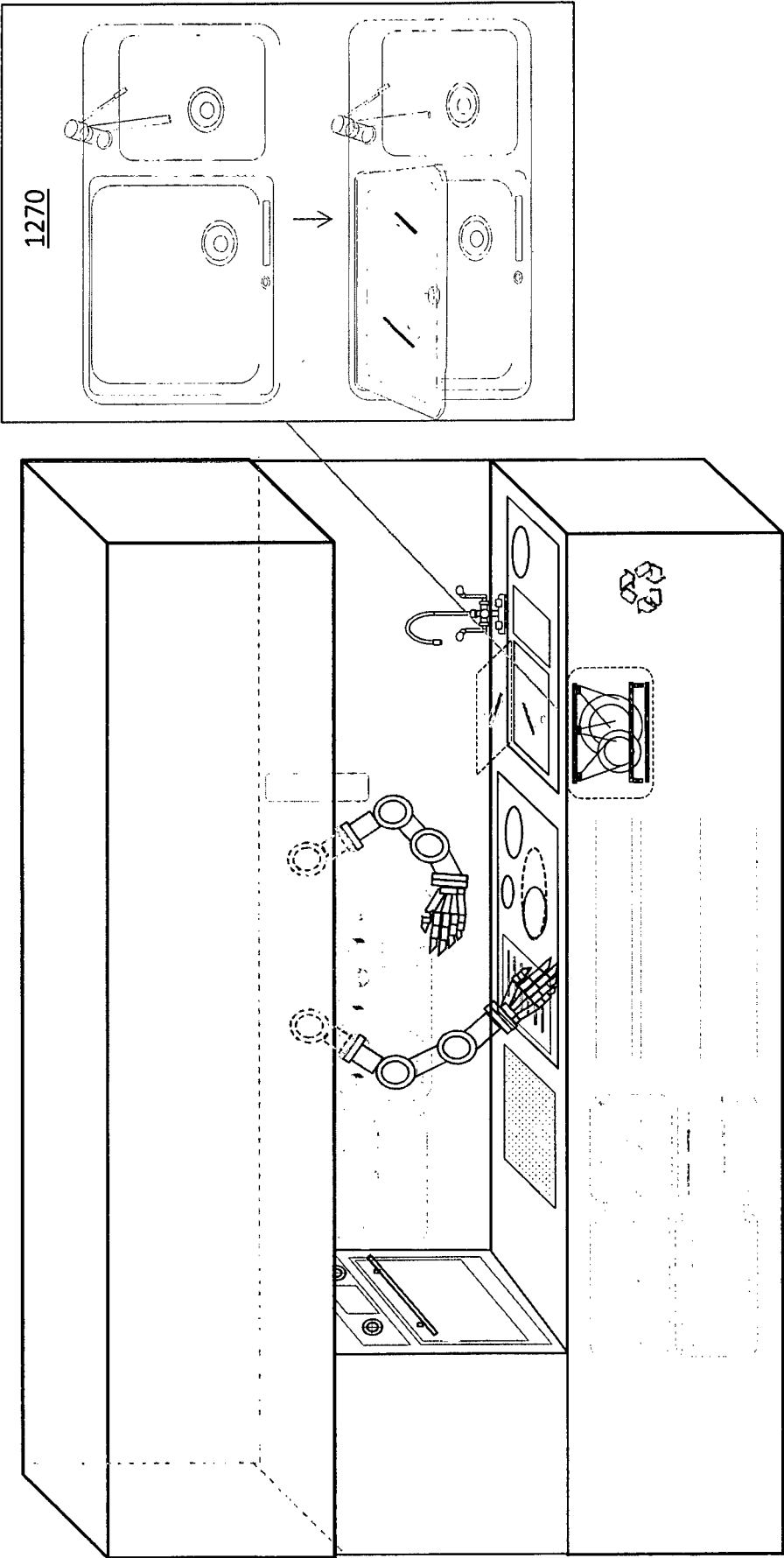


FIG. 41K

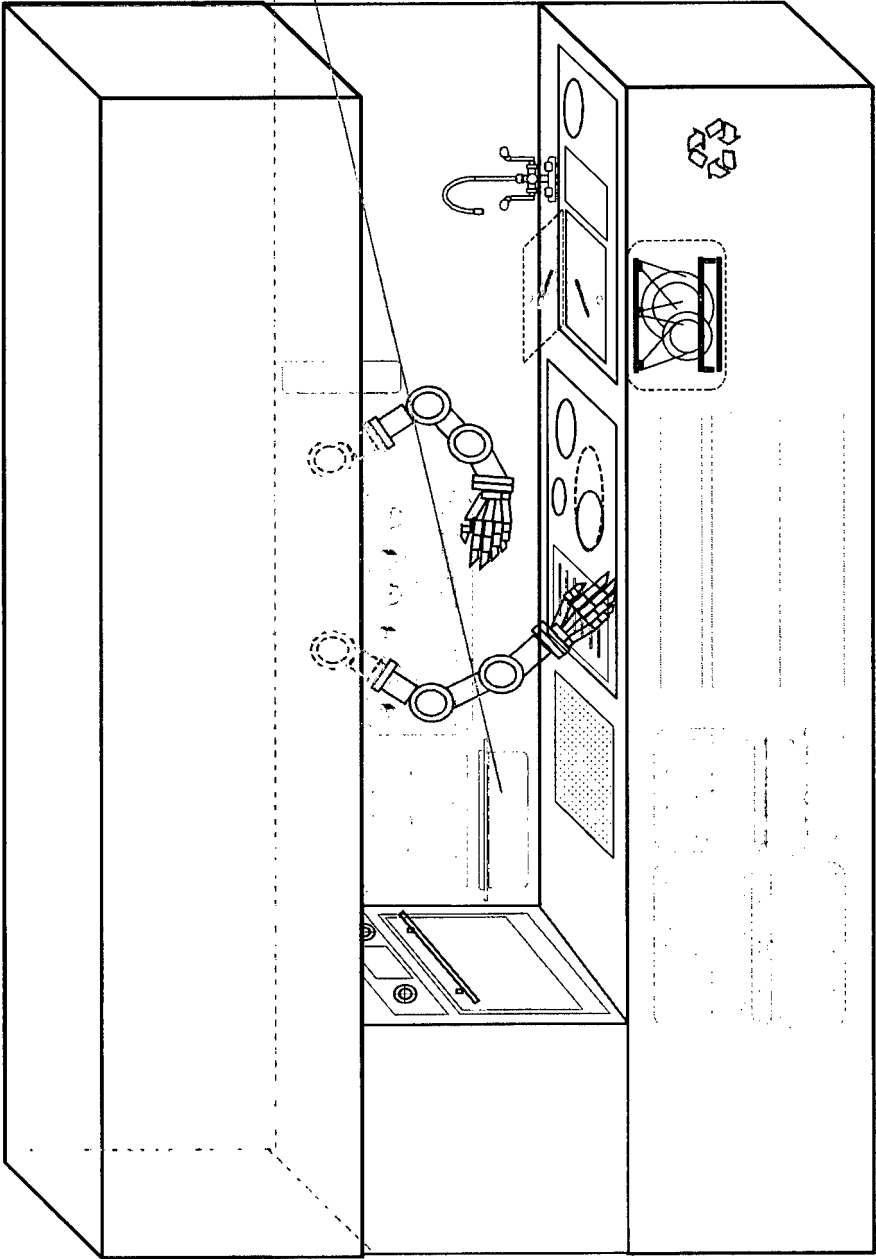
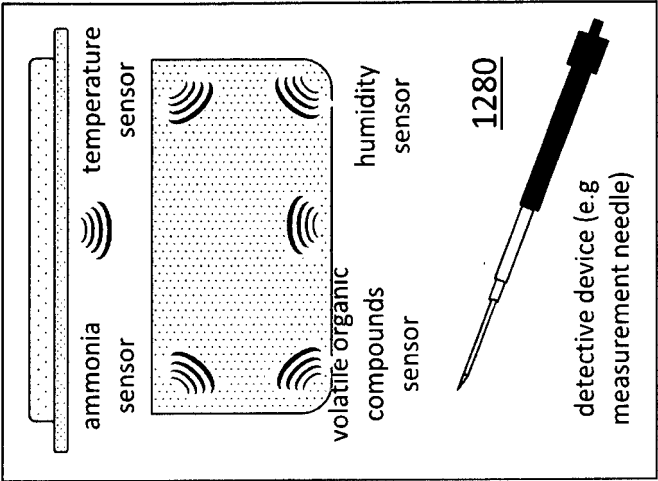
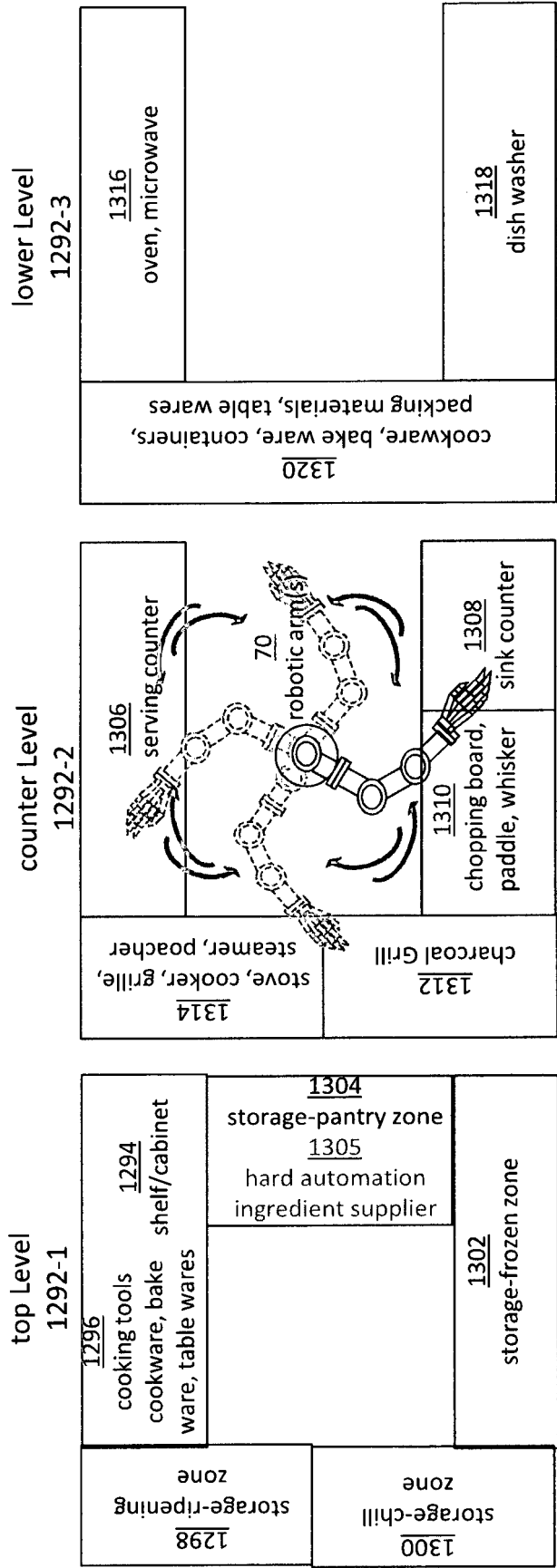


FIG. 41L



1290

FIG. 42A

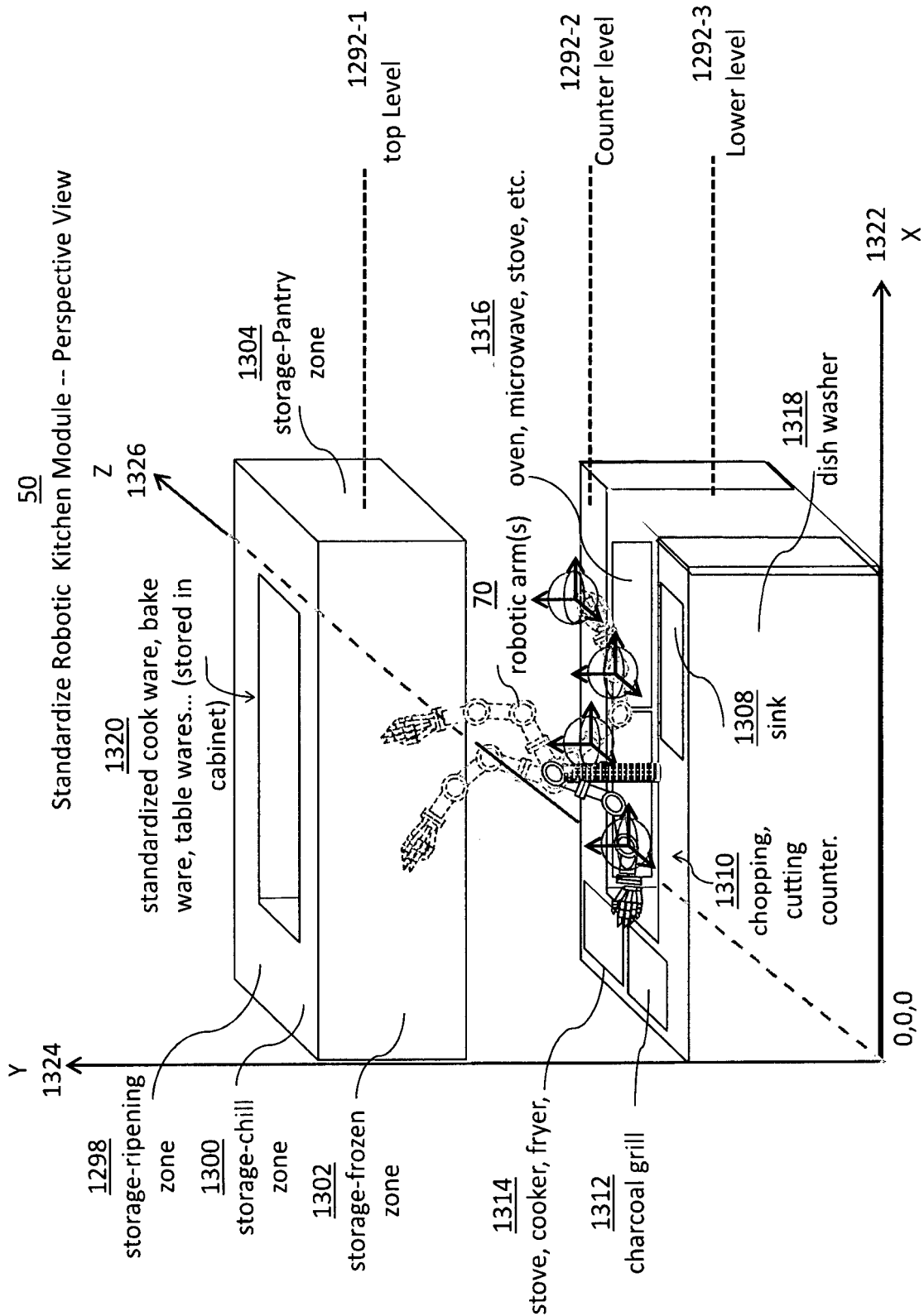


FIG. 42B

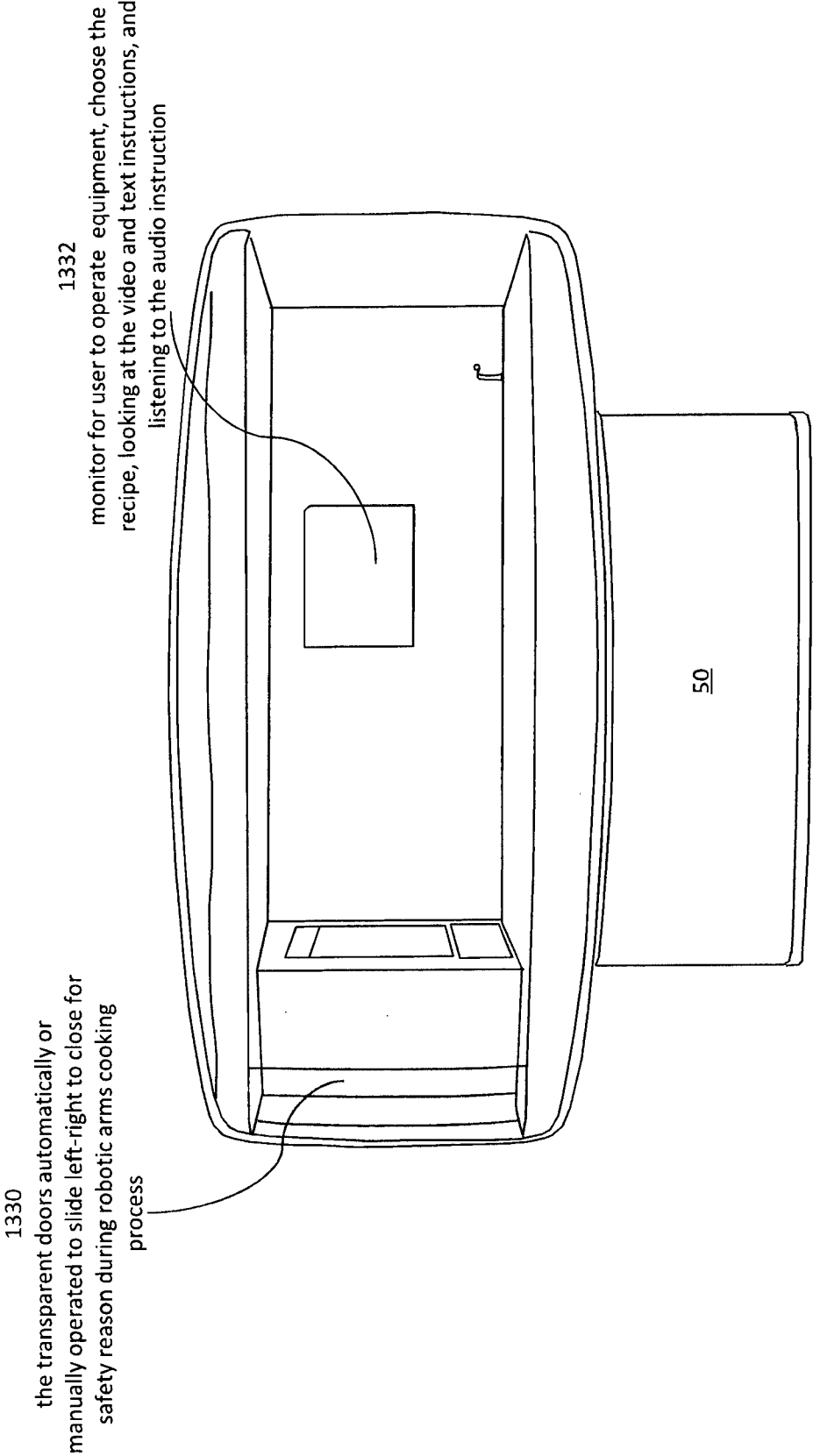


FIG. 43A

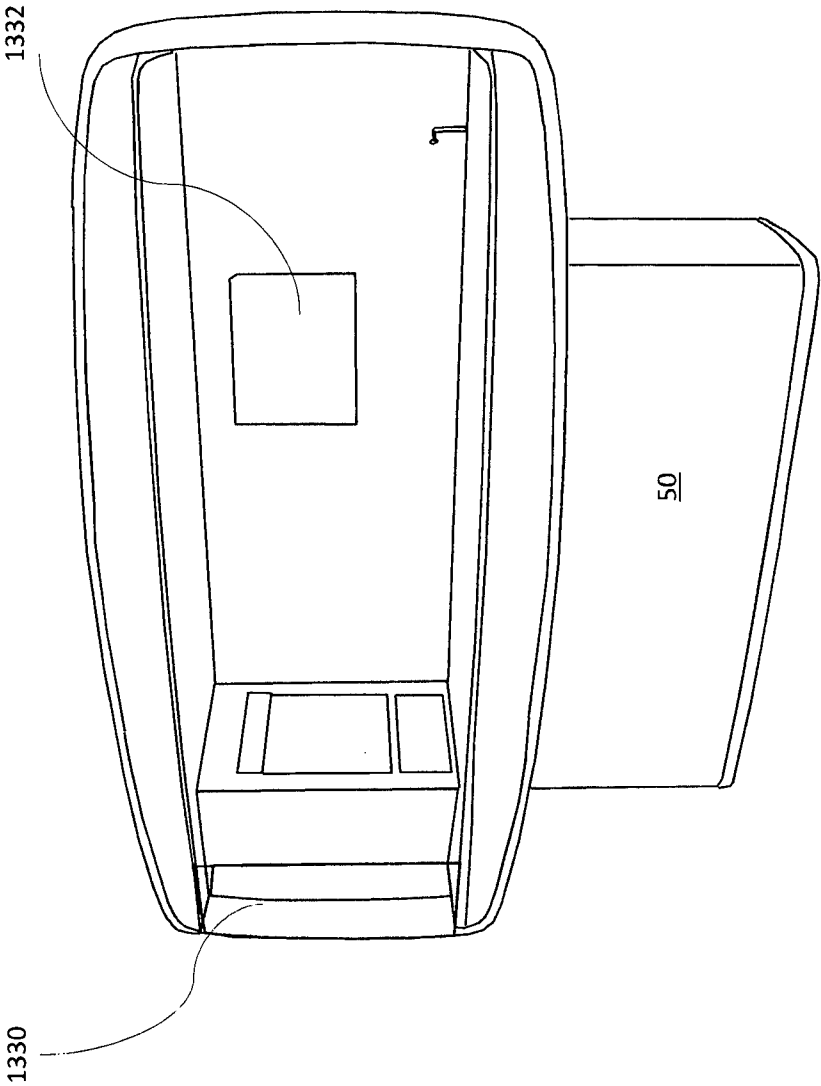


FIG. 43B

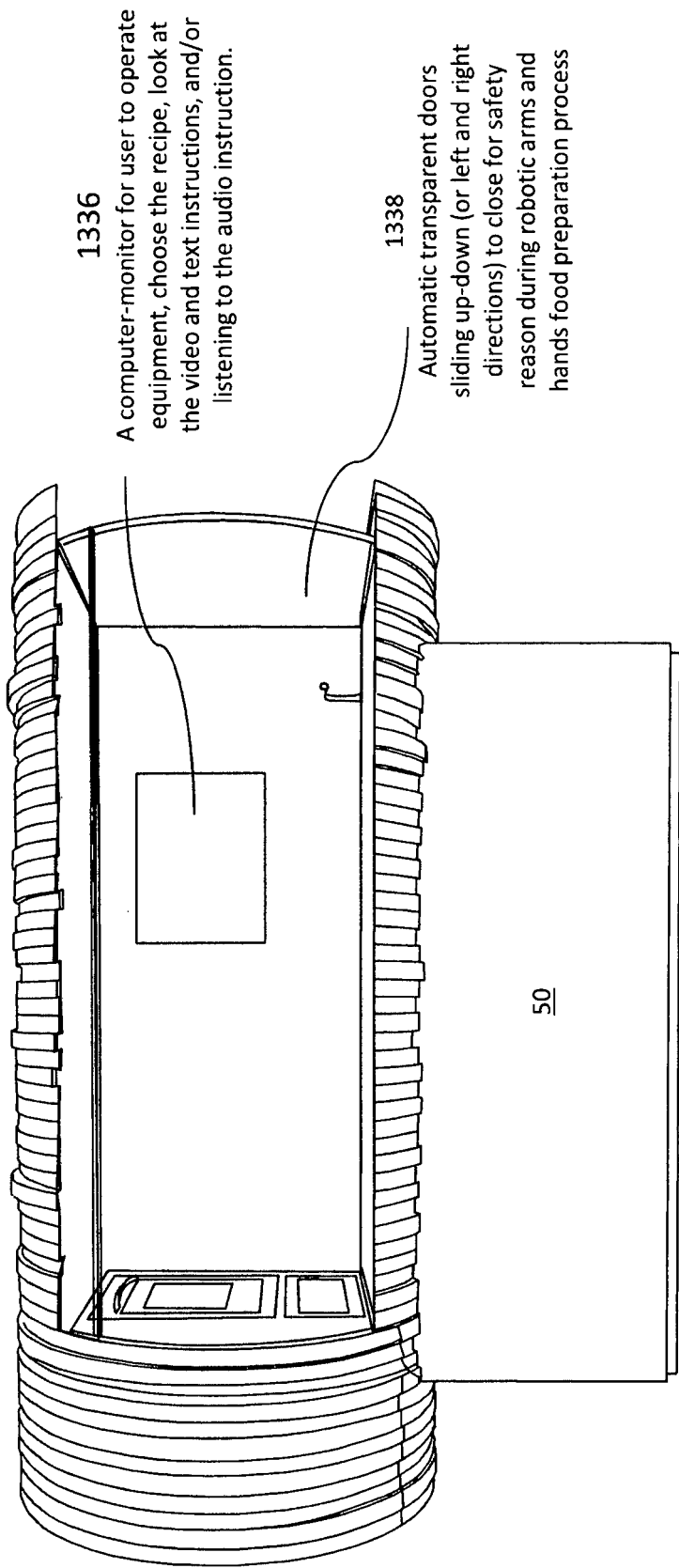


FIG. 44A

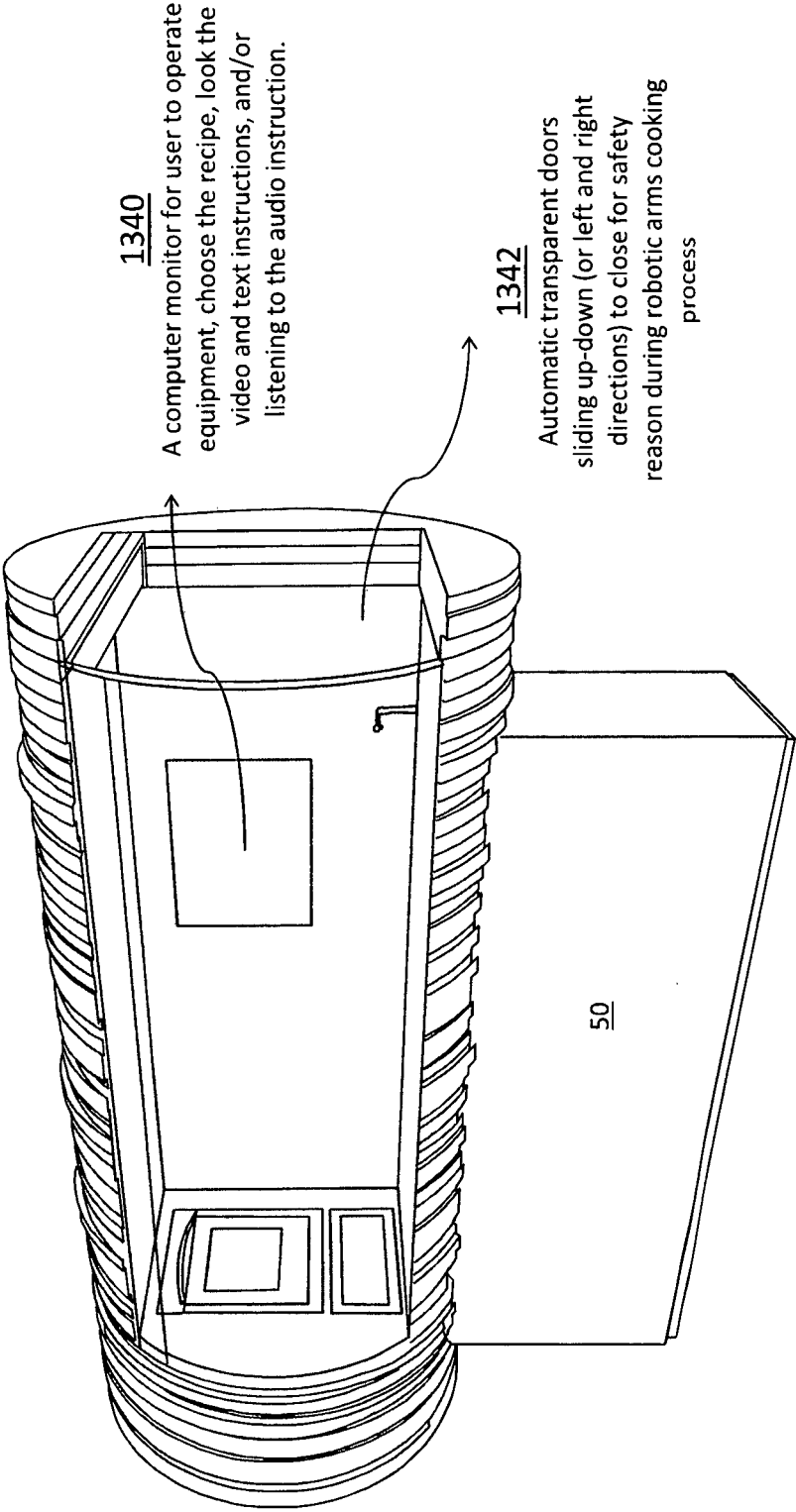


FIG. 44B

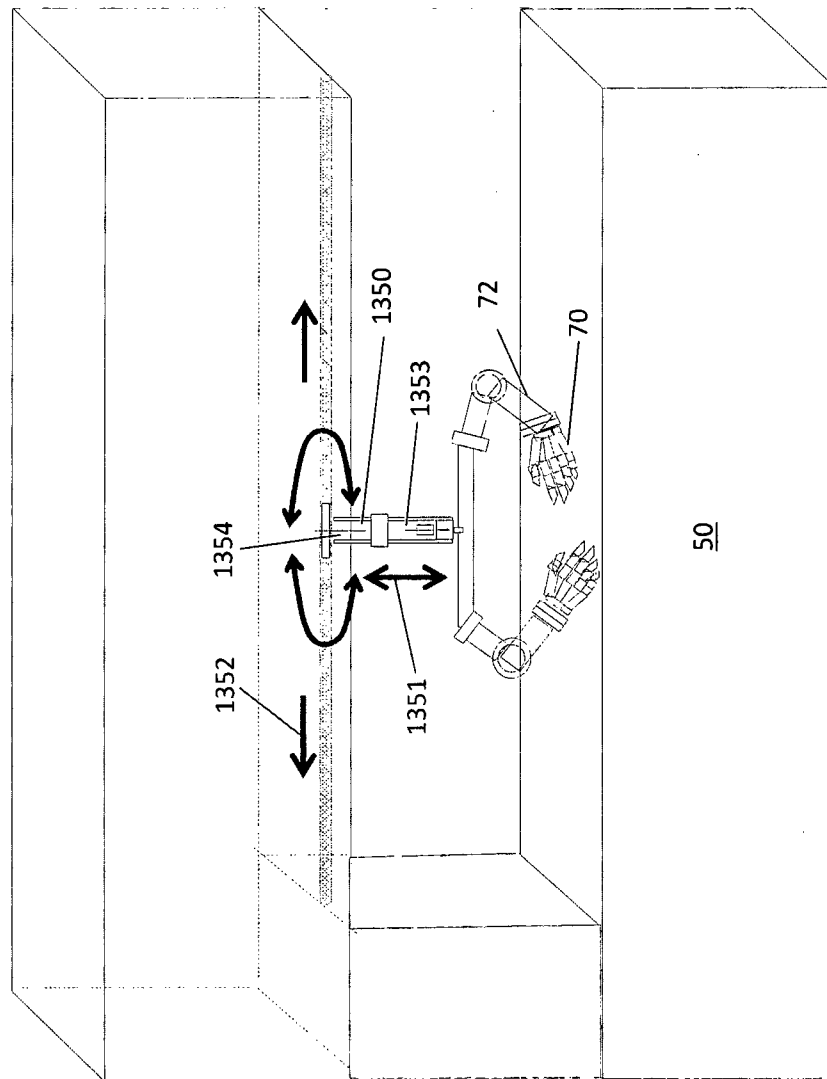
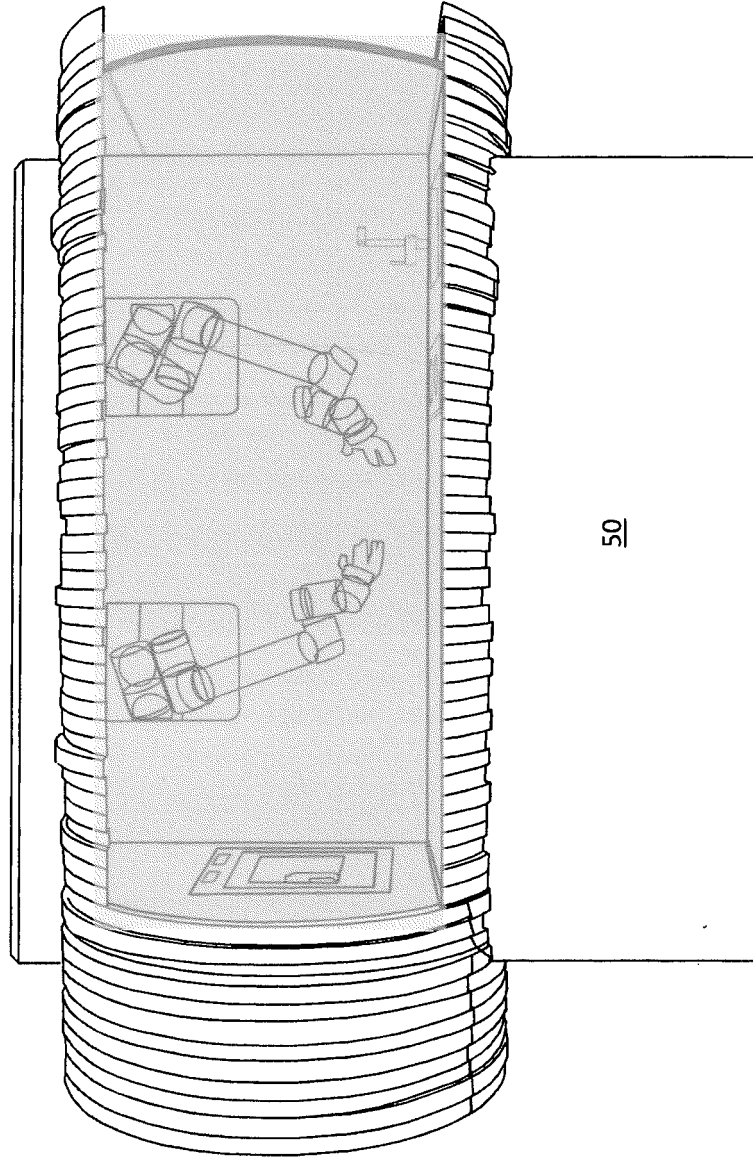


FIG. 45



1356

FIG. 46A

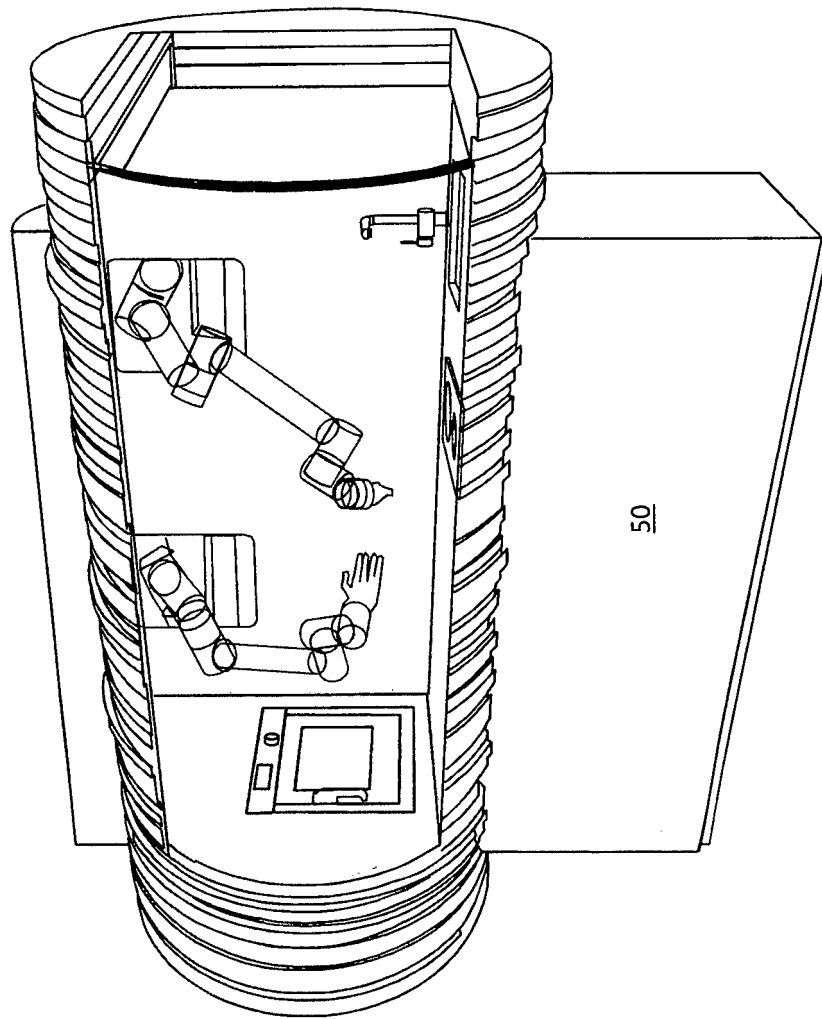
1358

FIG. 46B

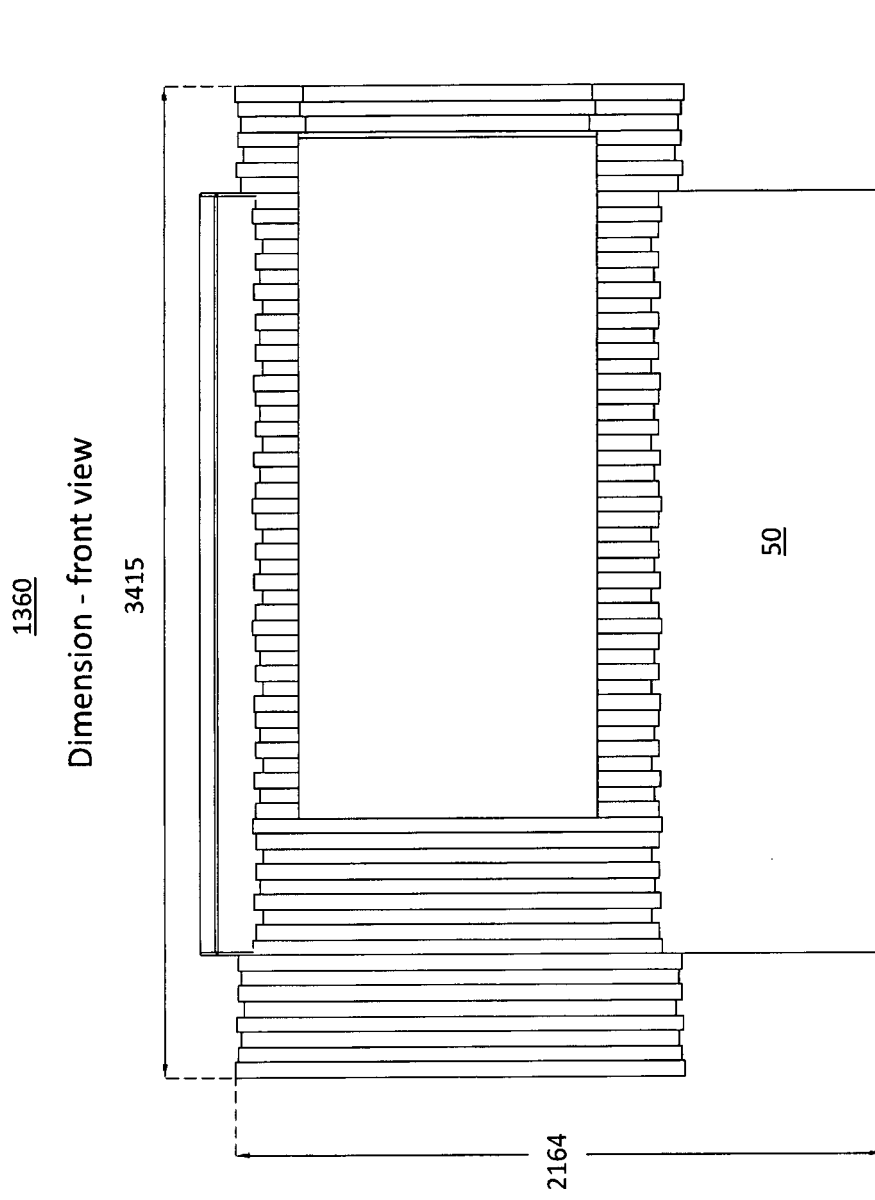


FIG. 46C

1362

dimension - section

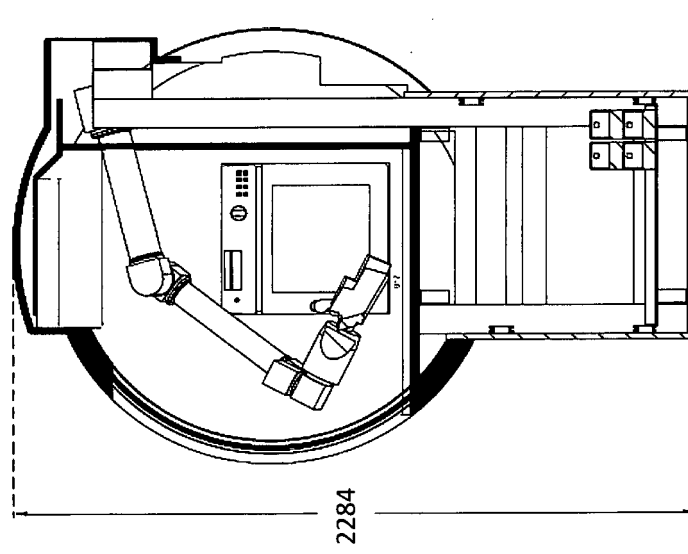


FIG. 46D

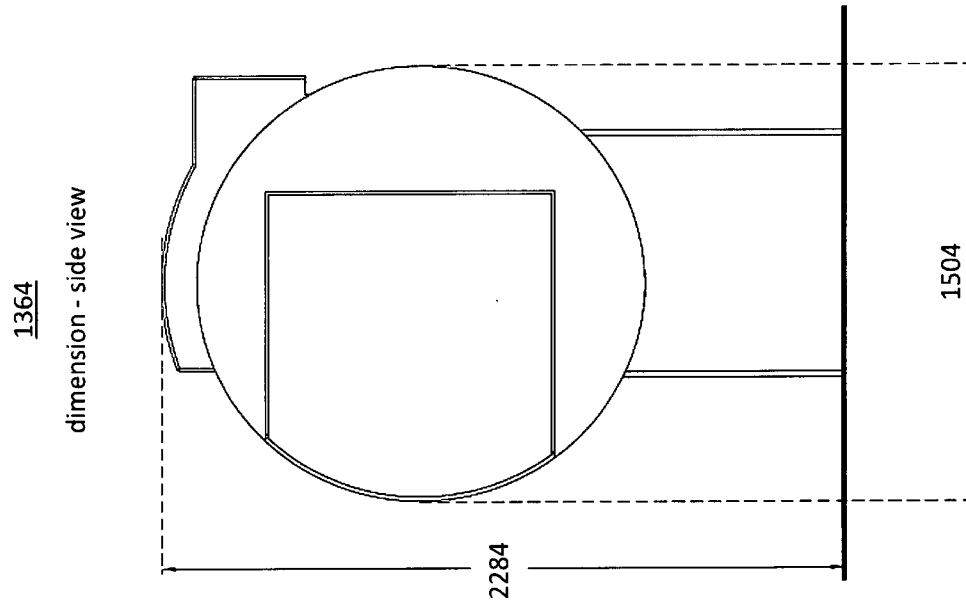


FIG. 46E

1366

dimension

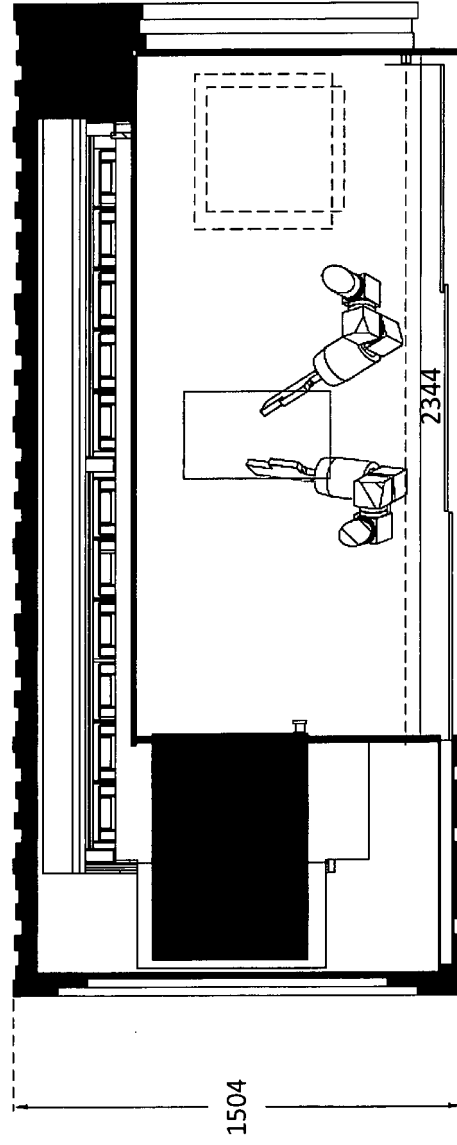


FIG. 46F

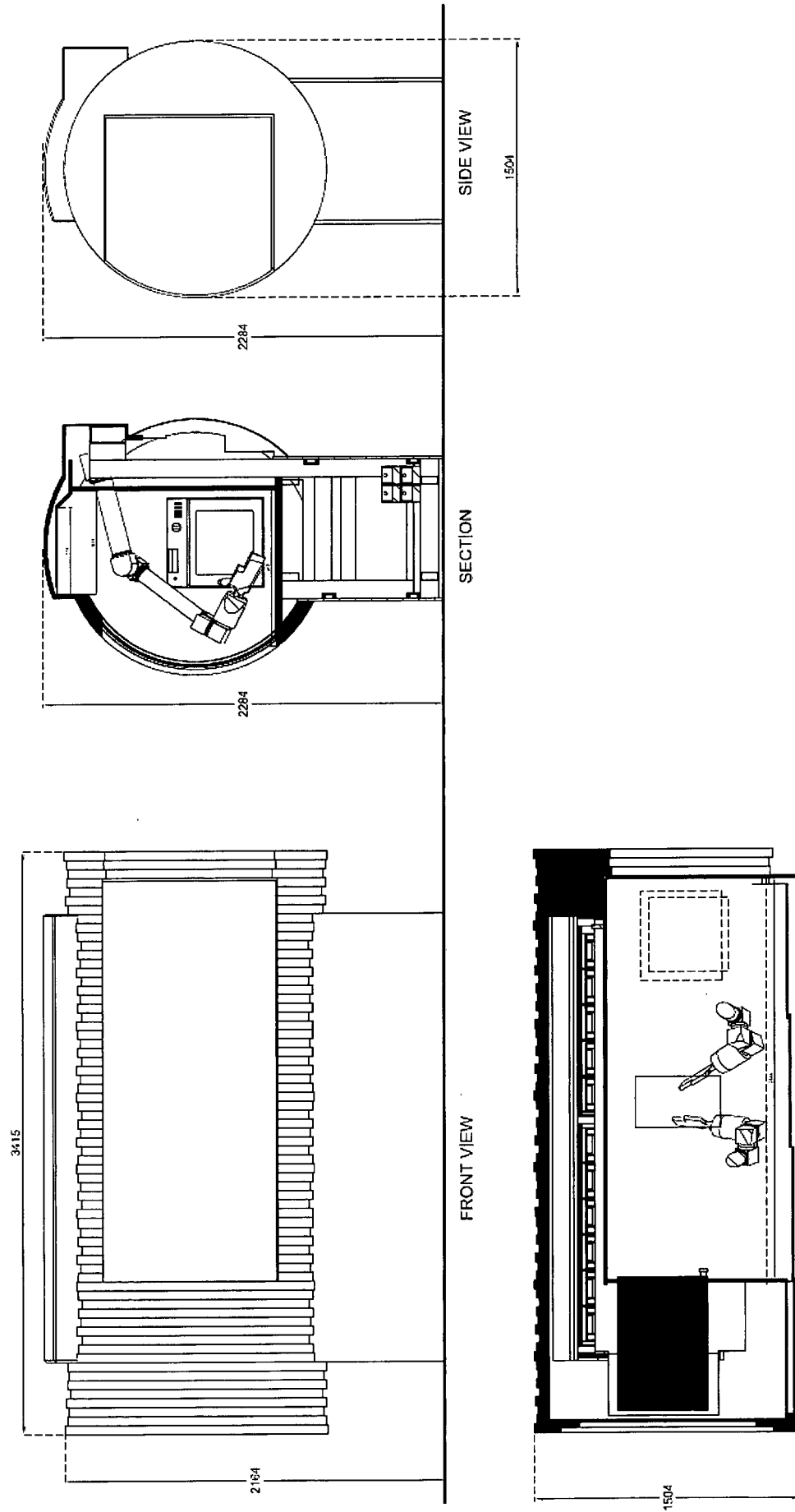


FIG. 46G

Programmable Storage System

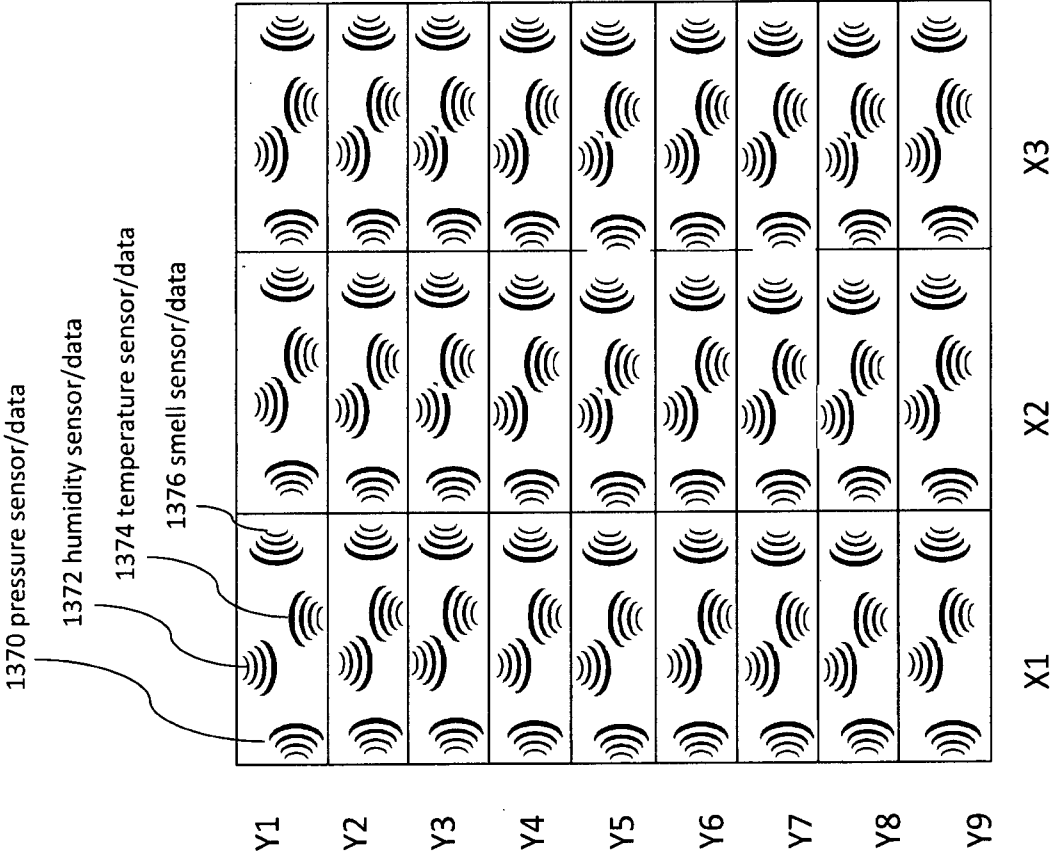


FIG. 47

Storage Station Containers Elevation View (one example)

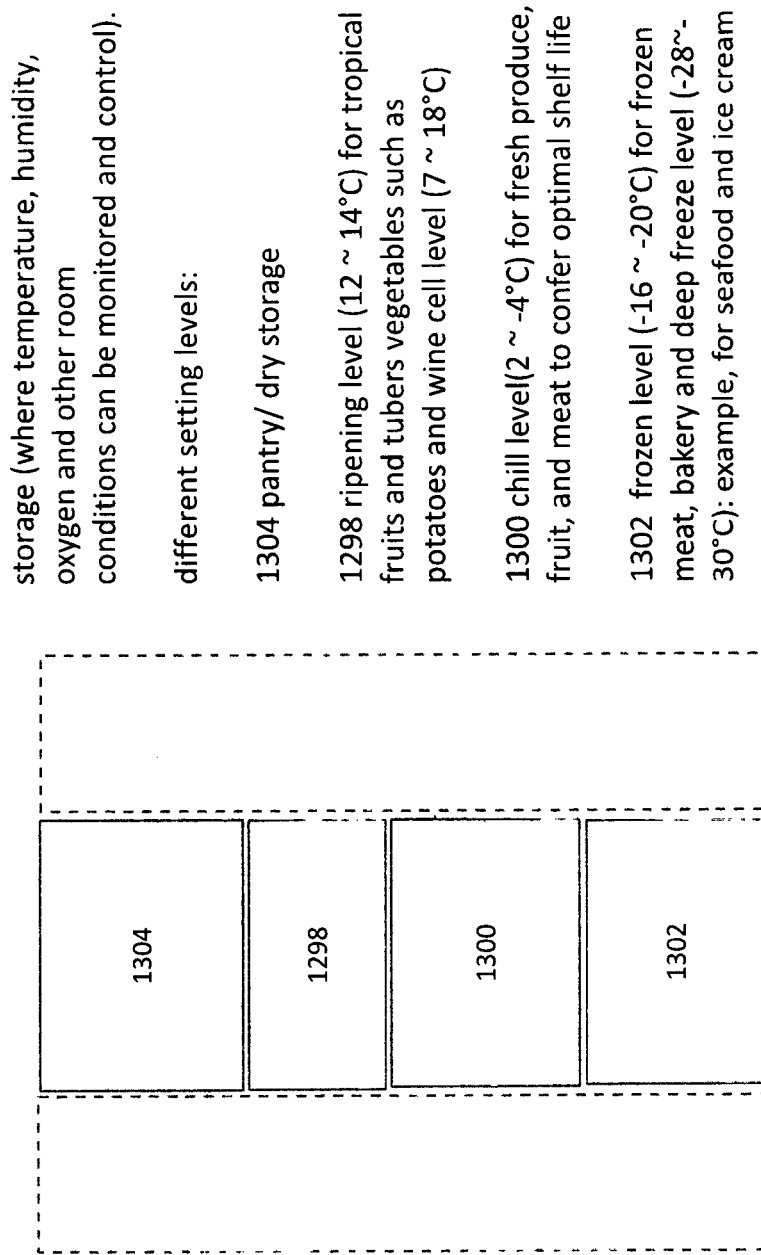


FIG. 48

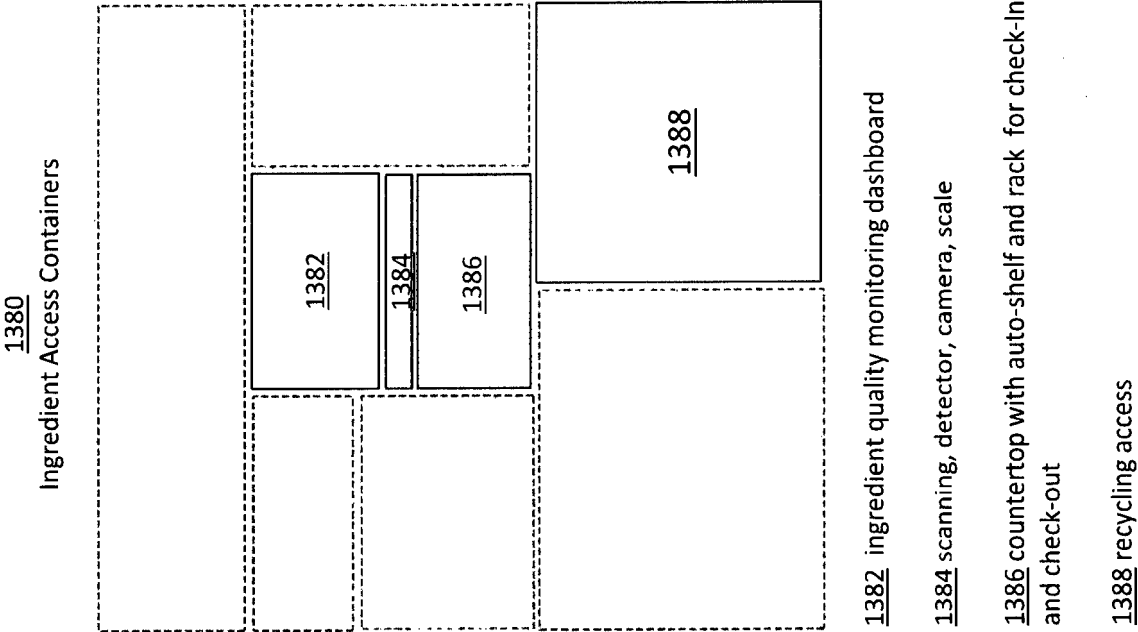


FIG. 49

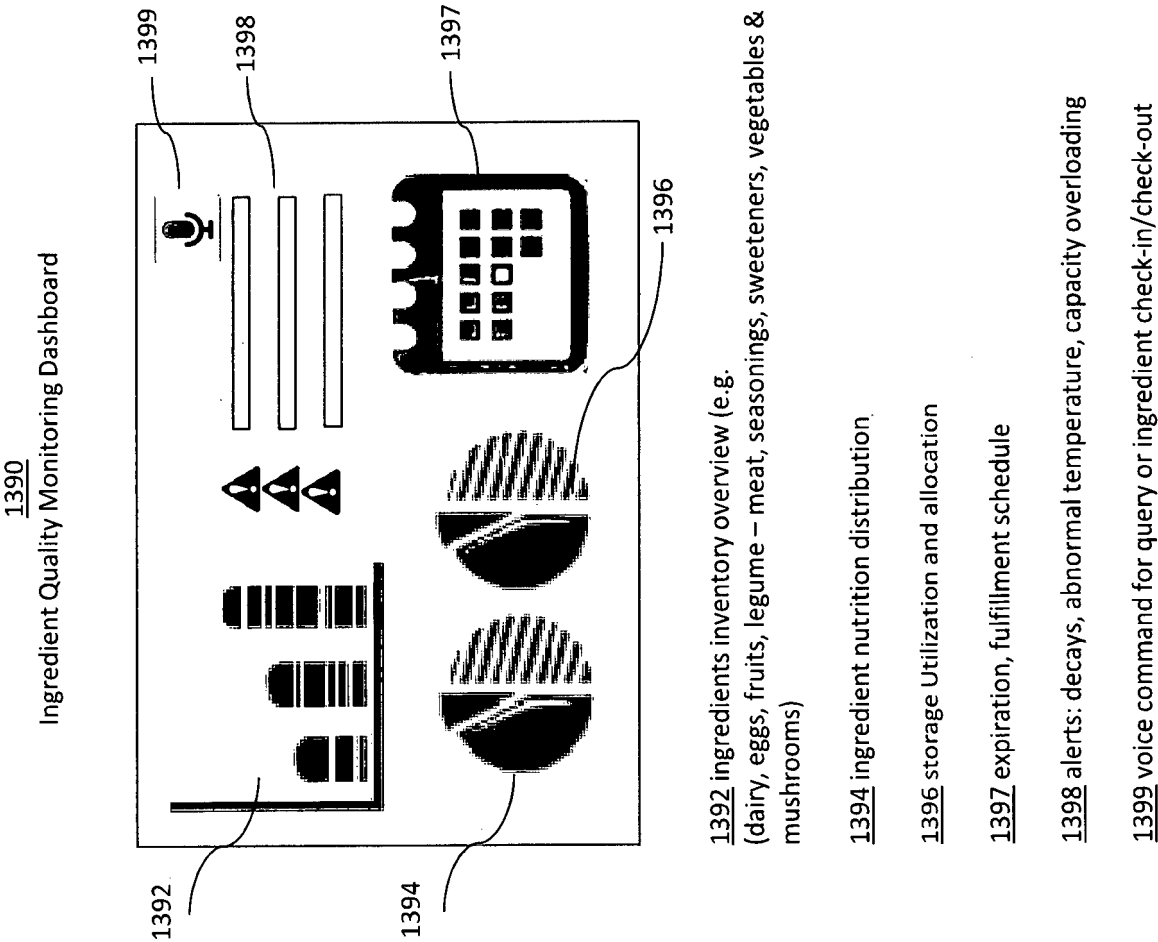


FIG. 50

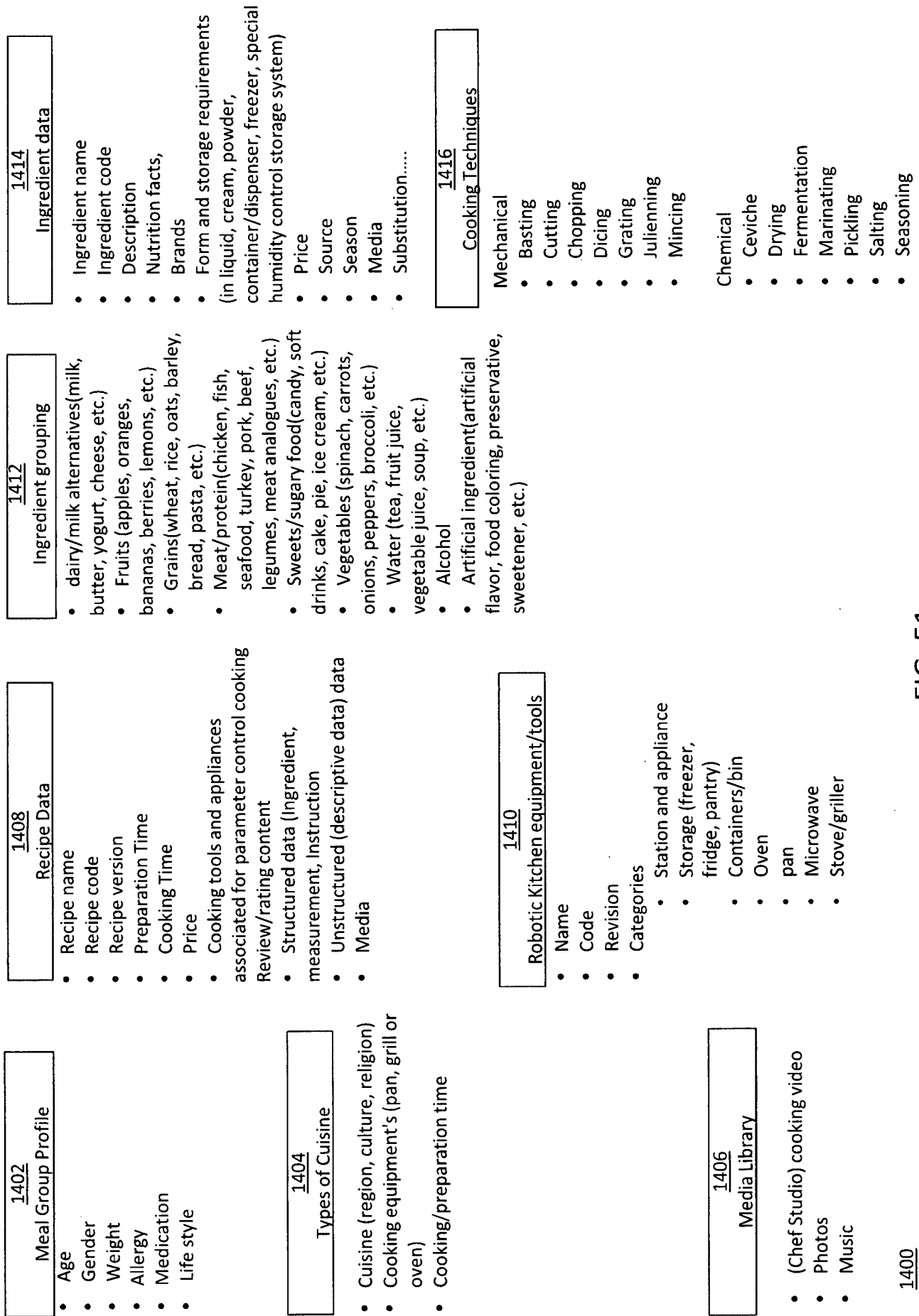


FIG. 51

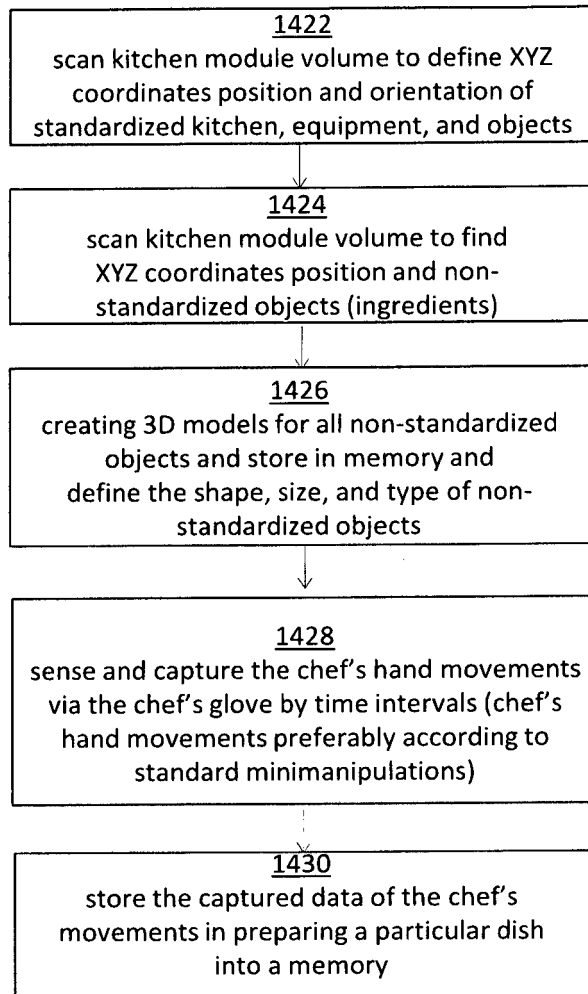
1420

FIG. 52

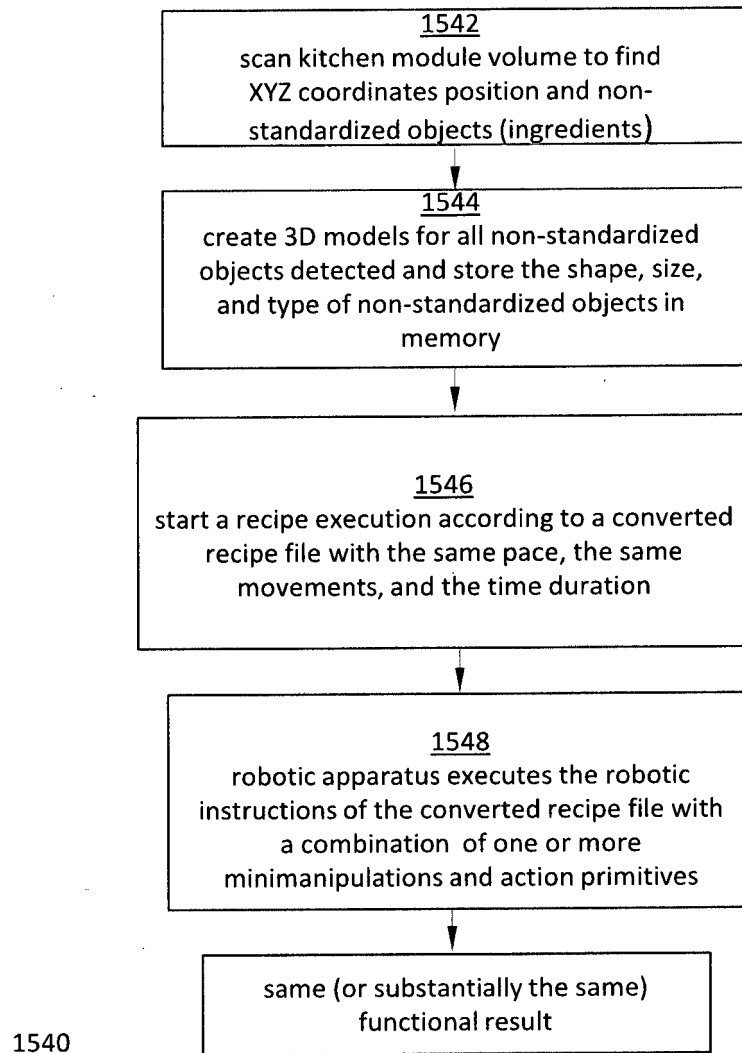


FIG. 53

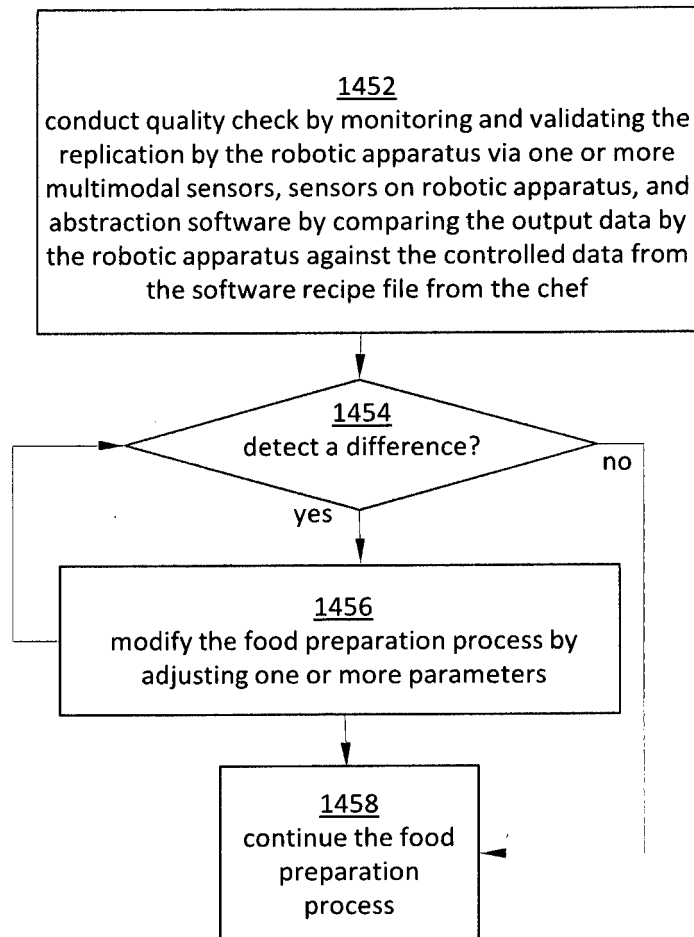
1450

FIG. 54

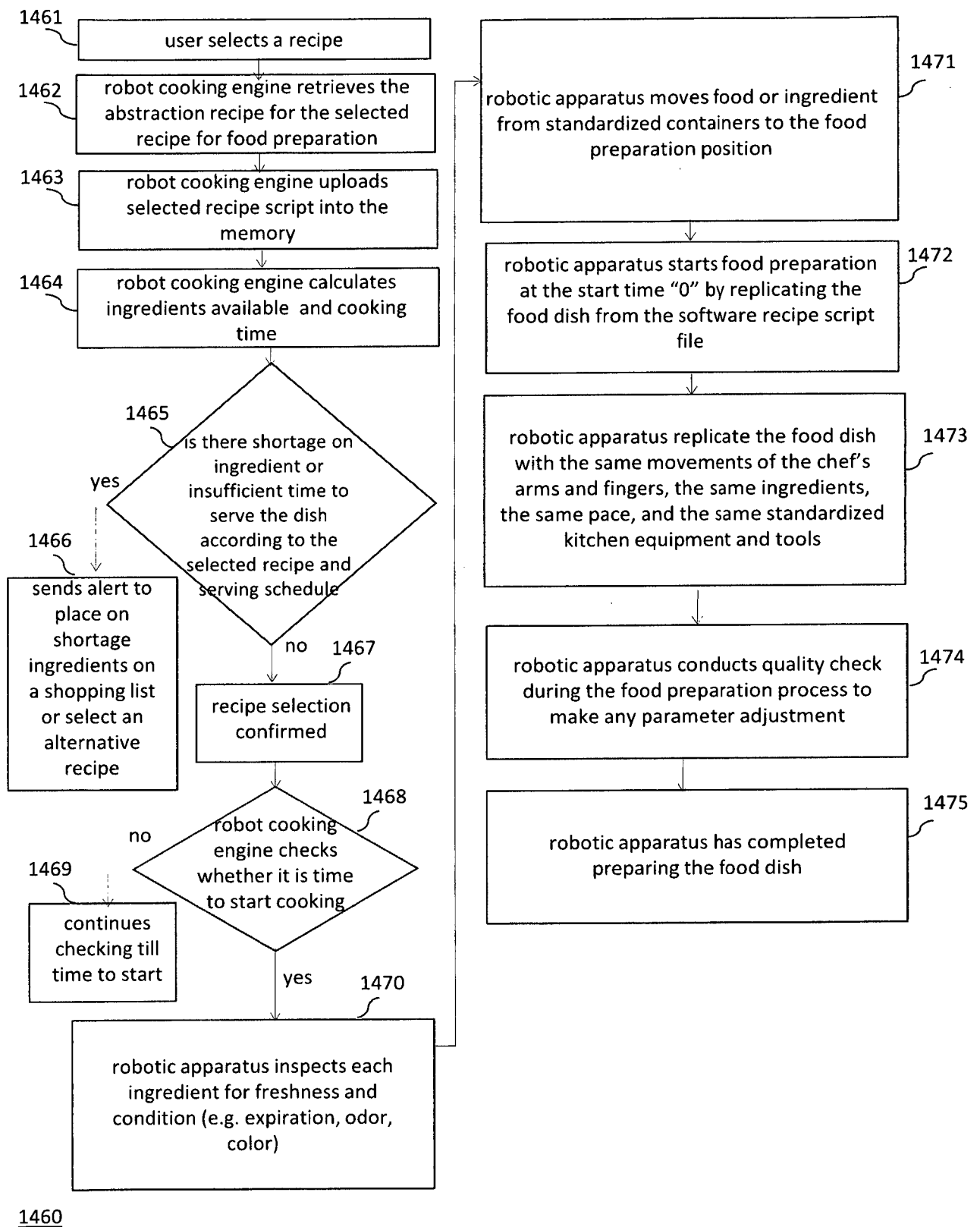


FIG. 55

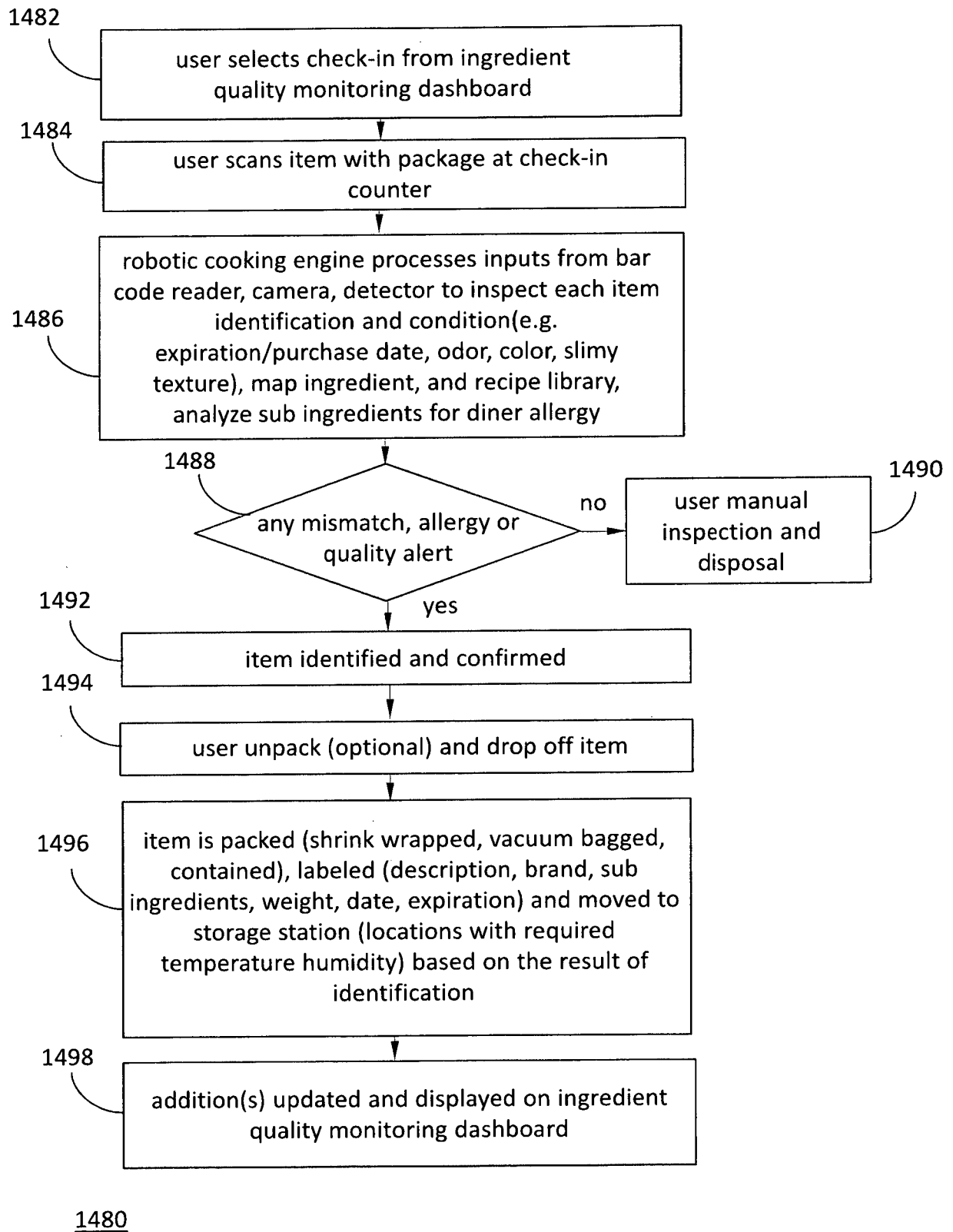


FIG. 56

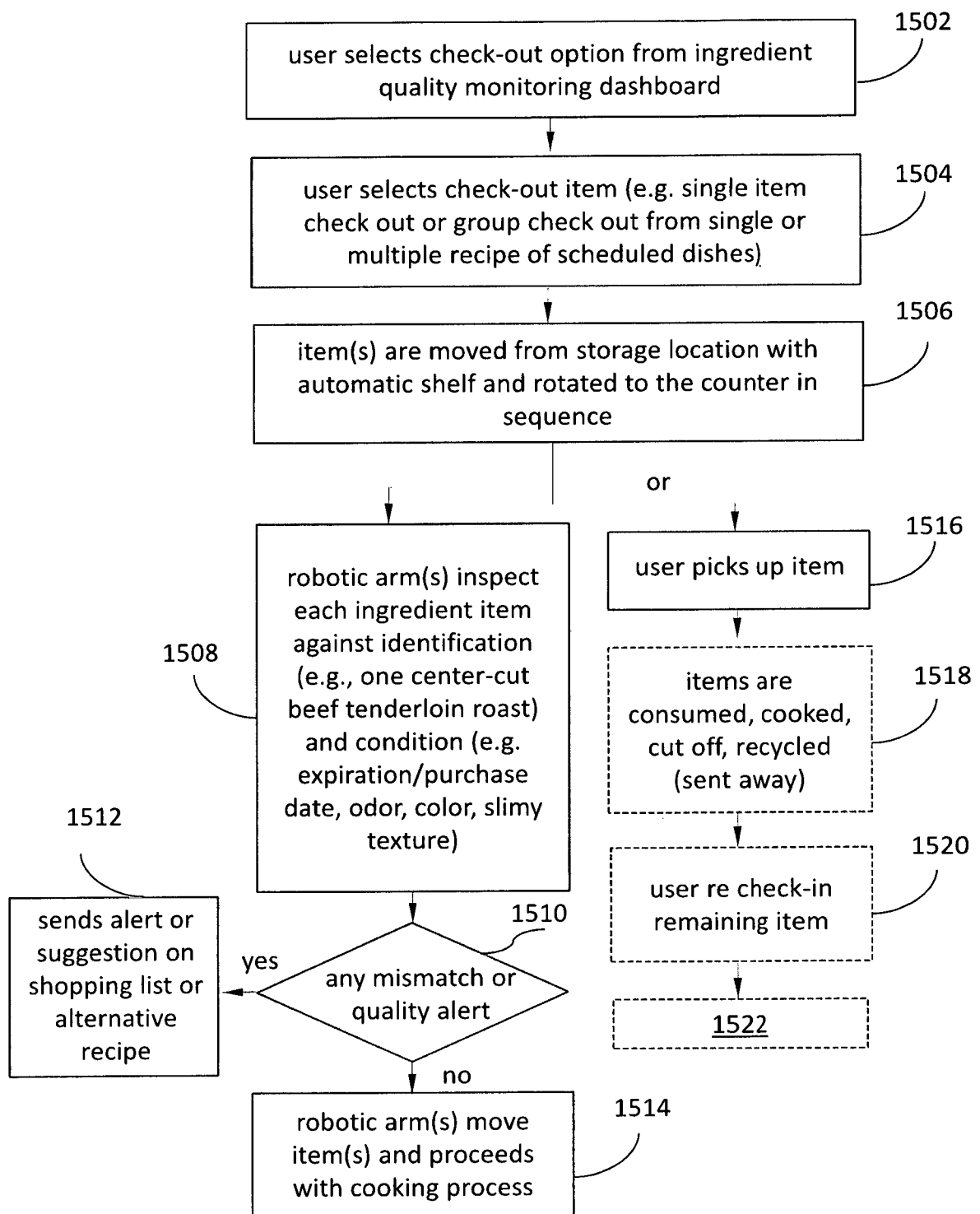
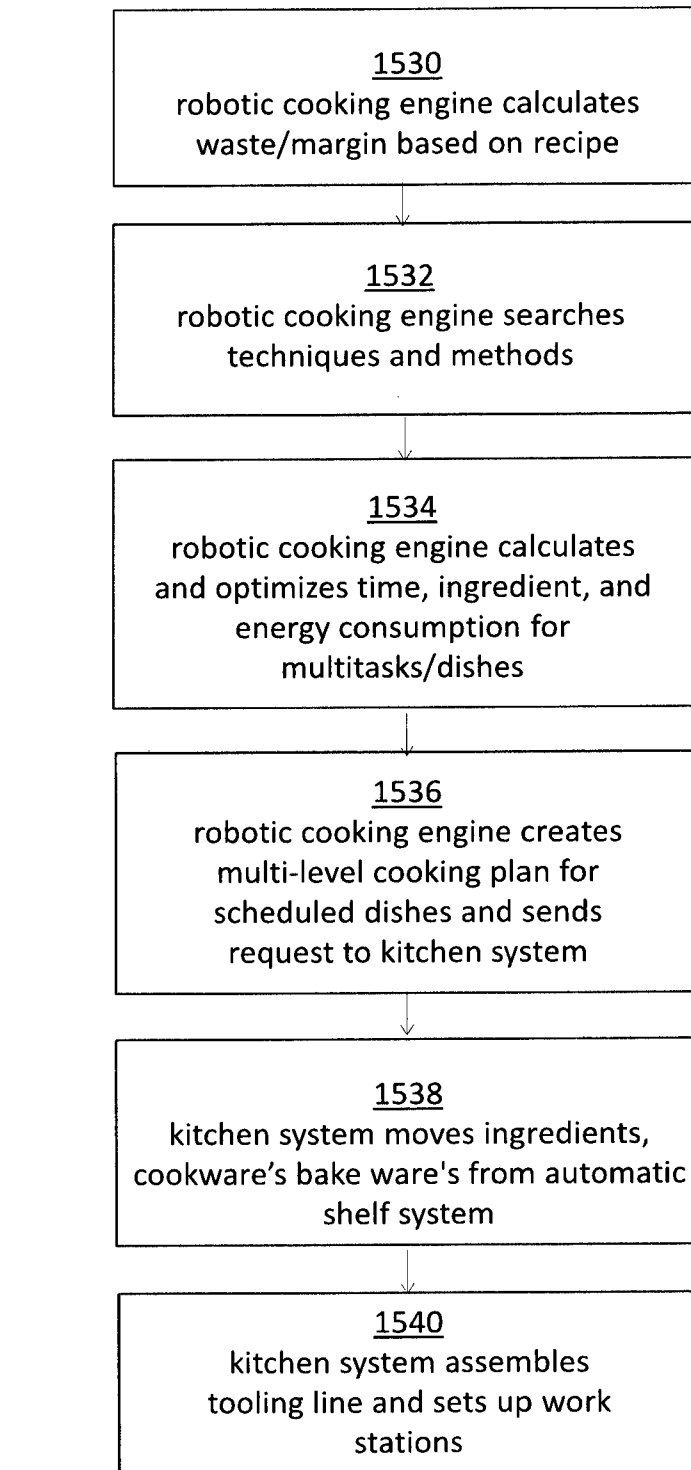
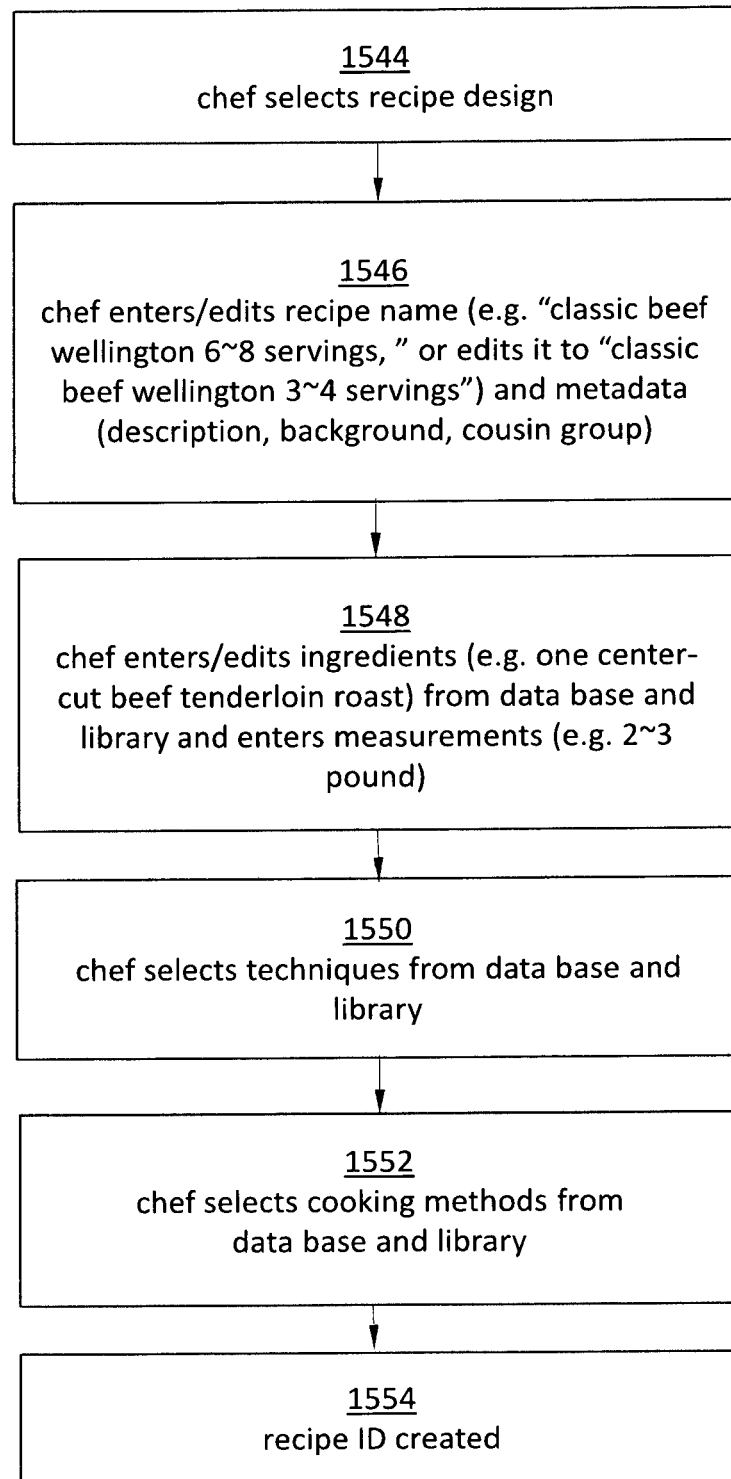


FIG. 57



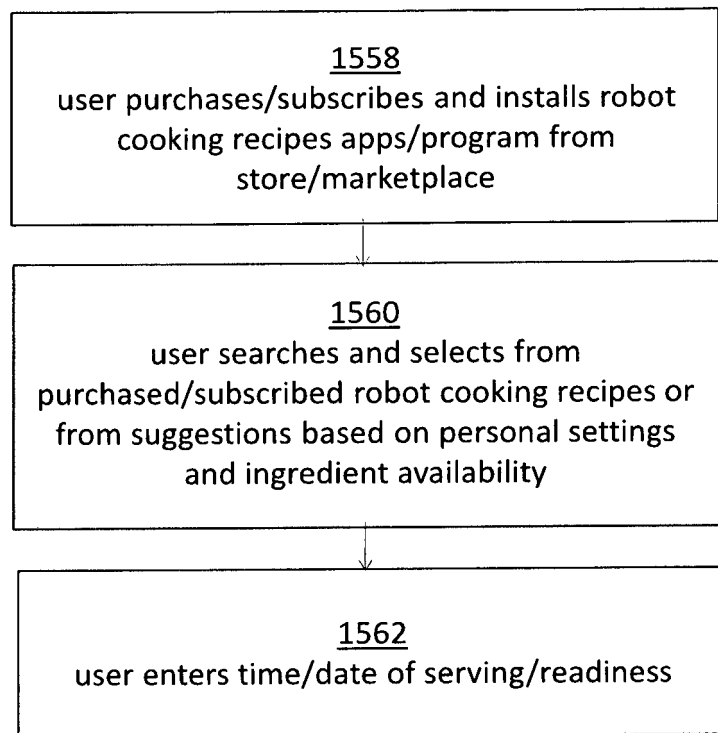
1524

FIG. 58



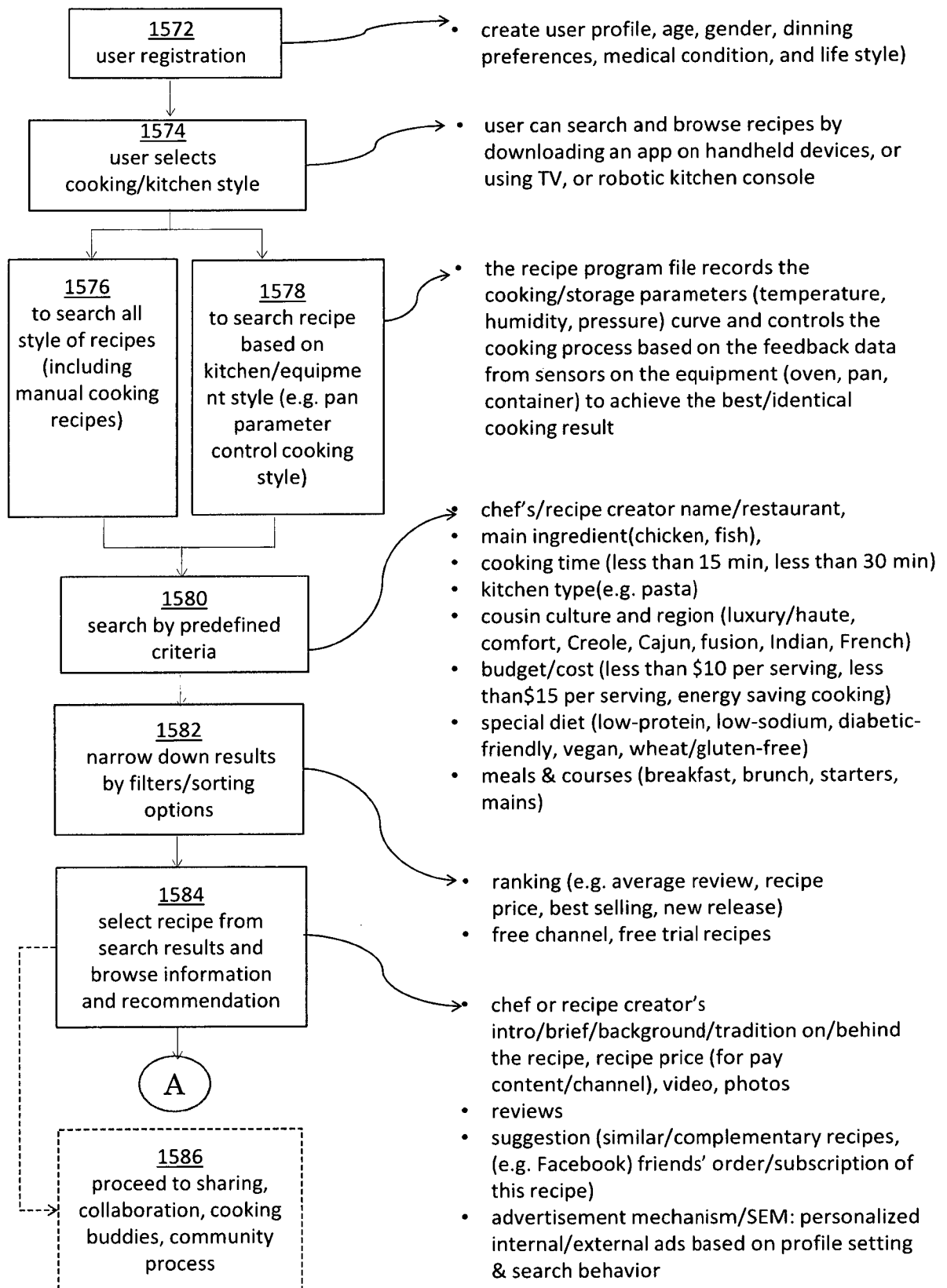
1542

FIG. 59



1556

FIG. 60



1570

FIG. 61A

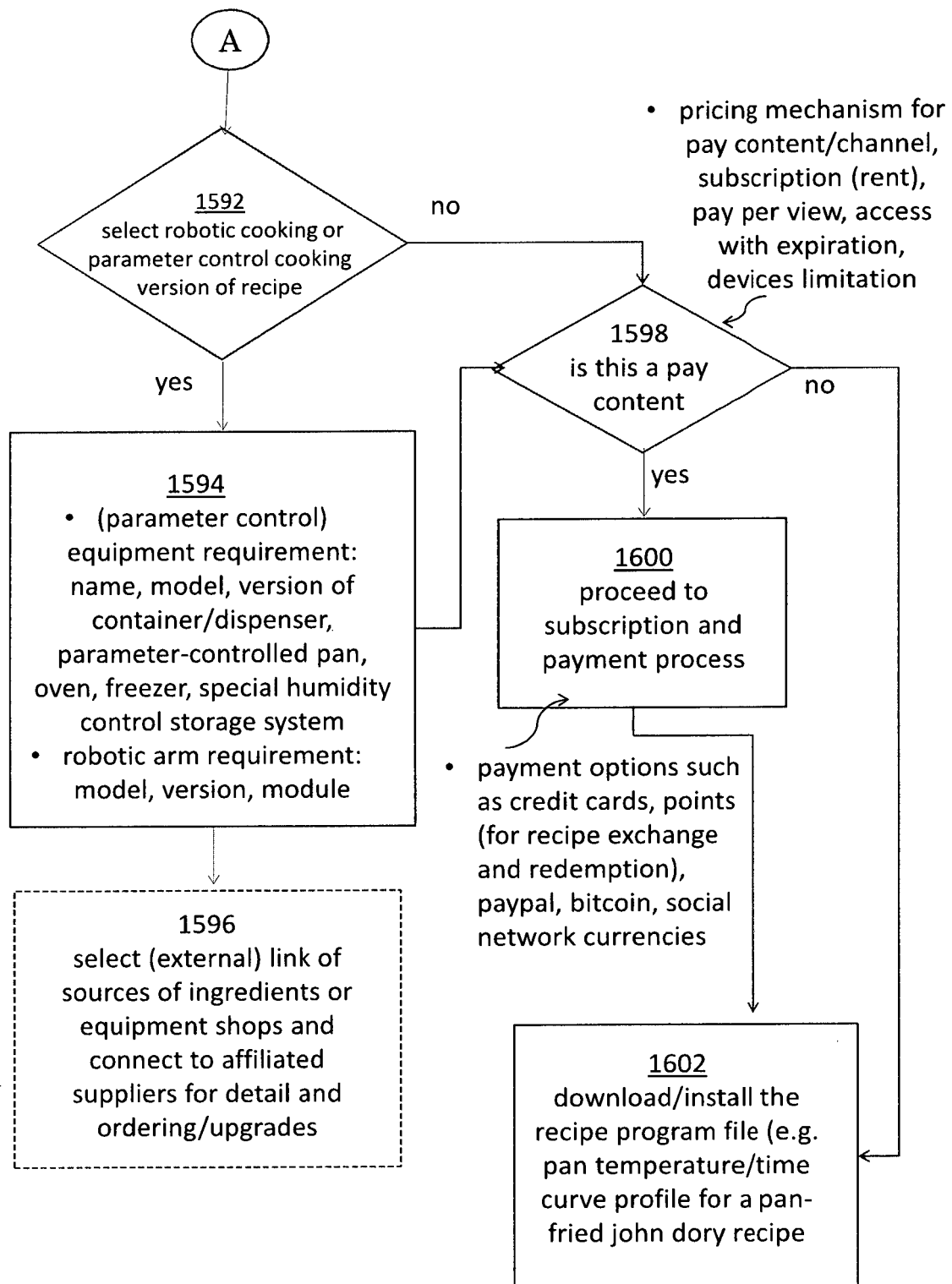


FIG. 61B

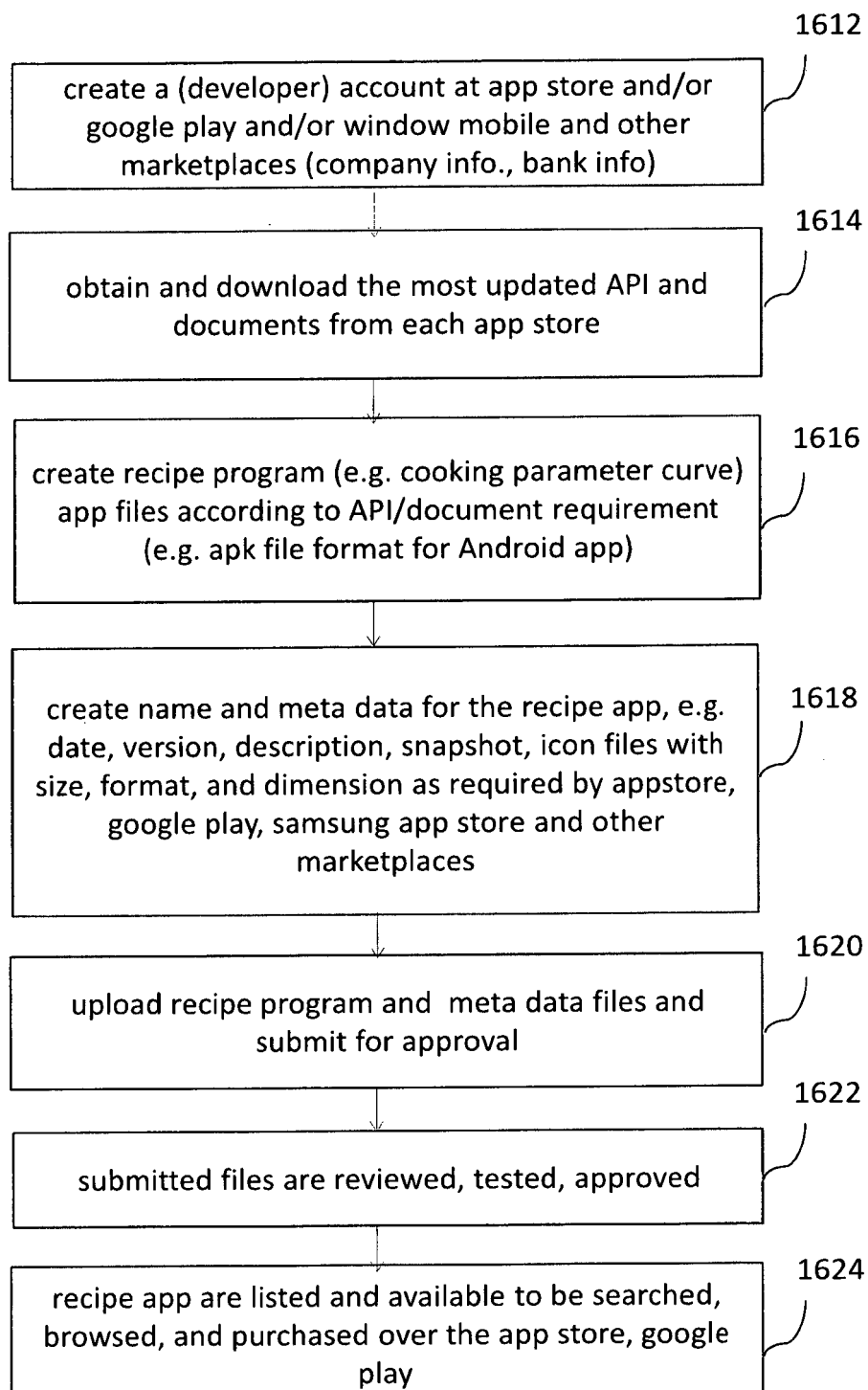
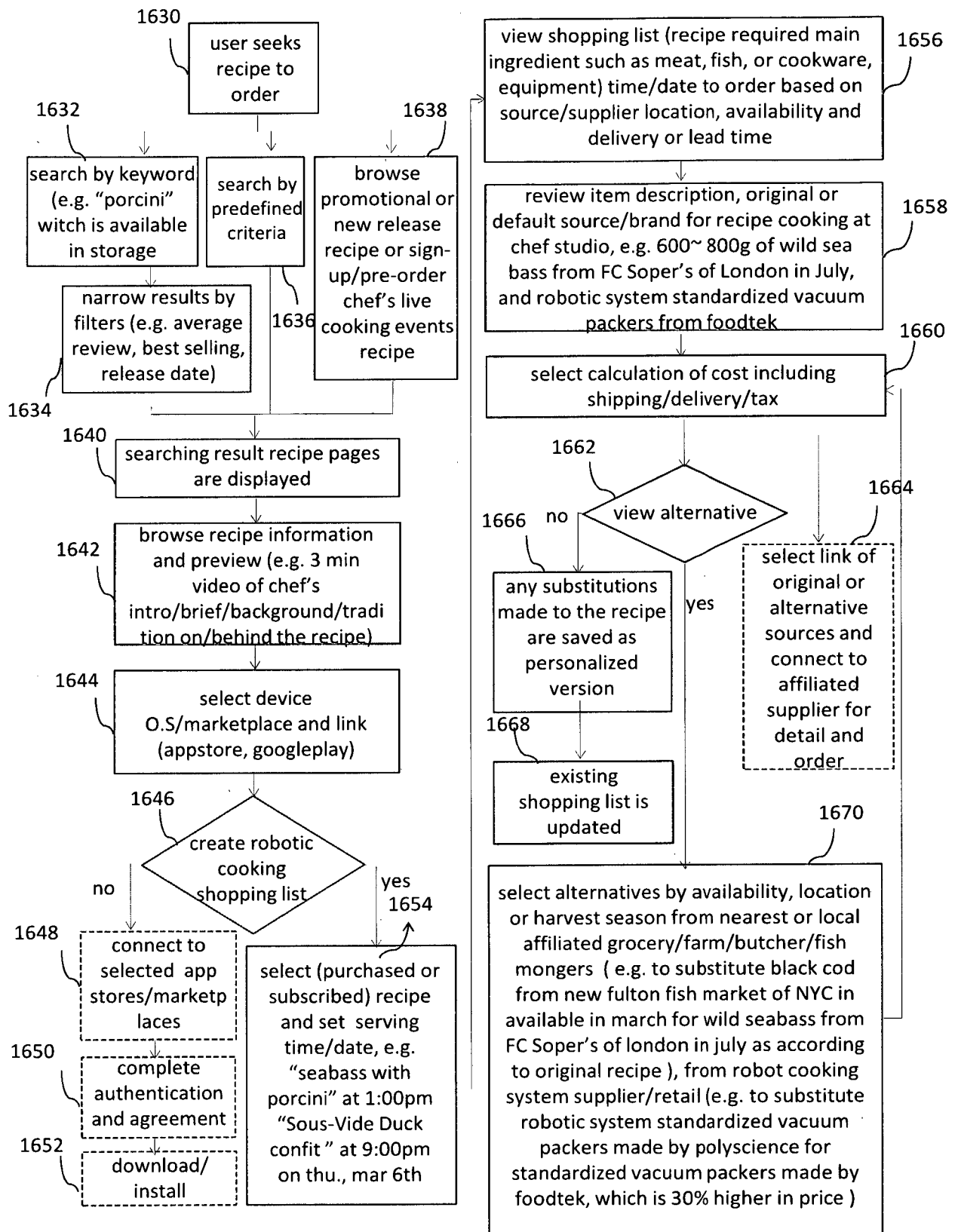
1610

FIG. 62



1628

FIG. 63

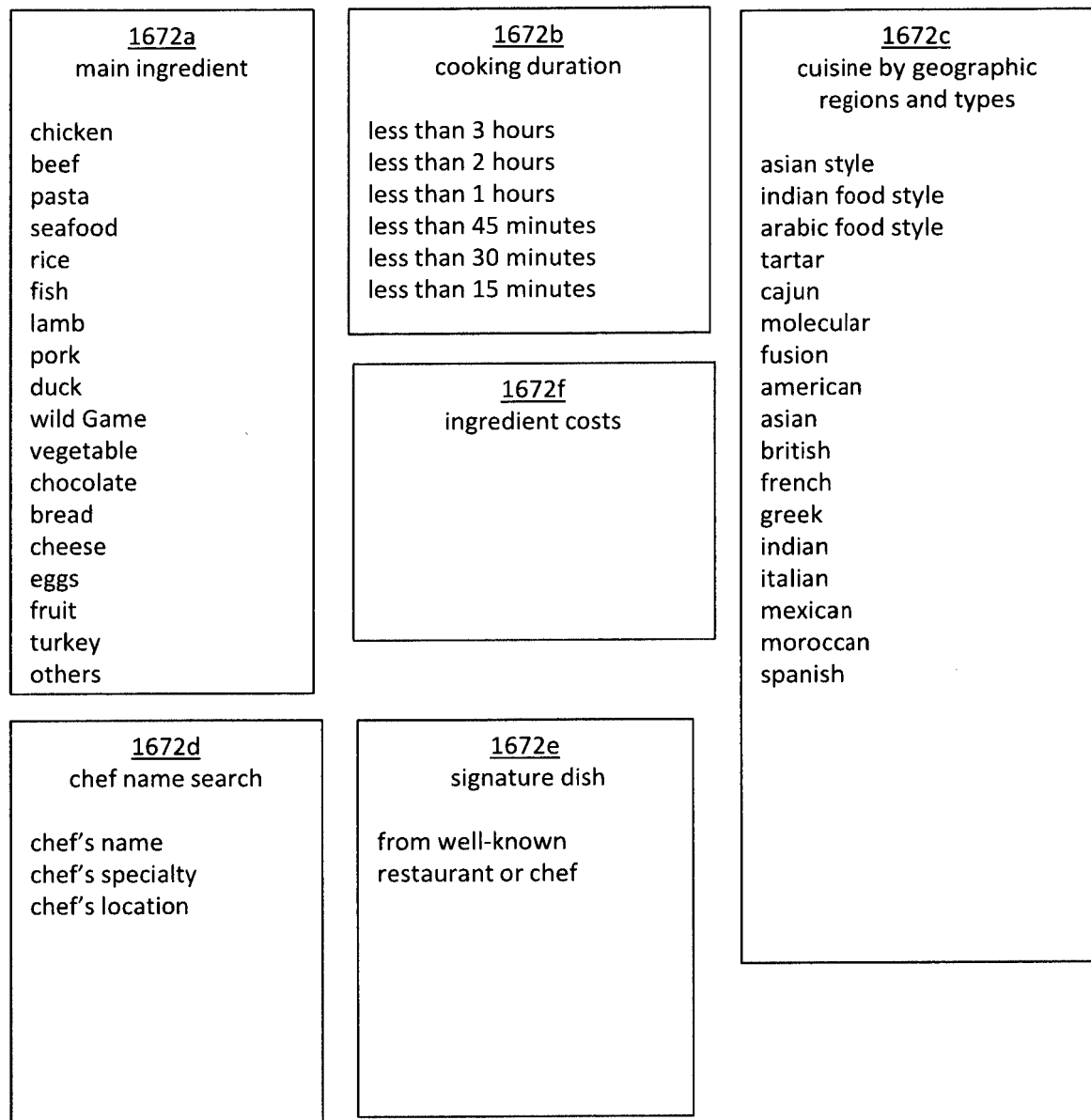
1672

FIG. 64A

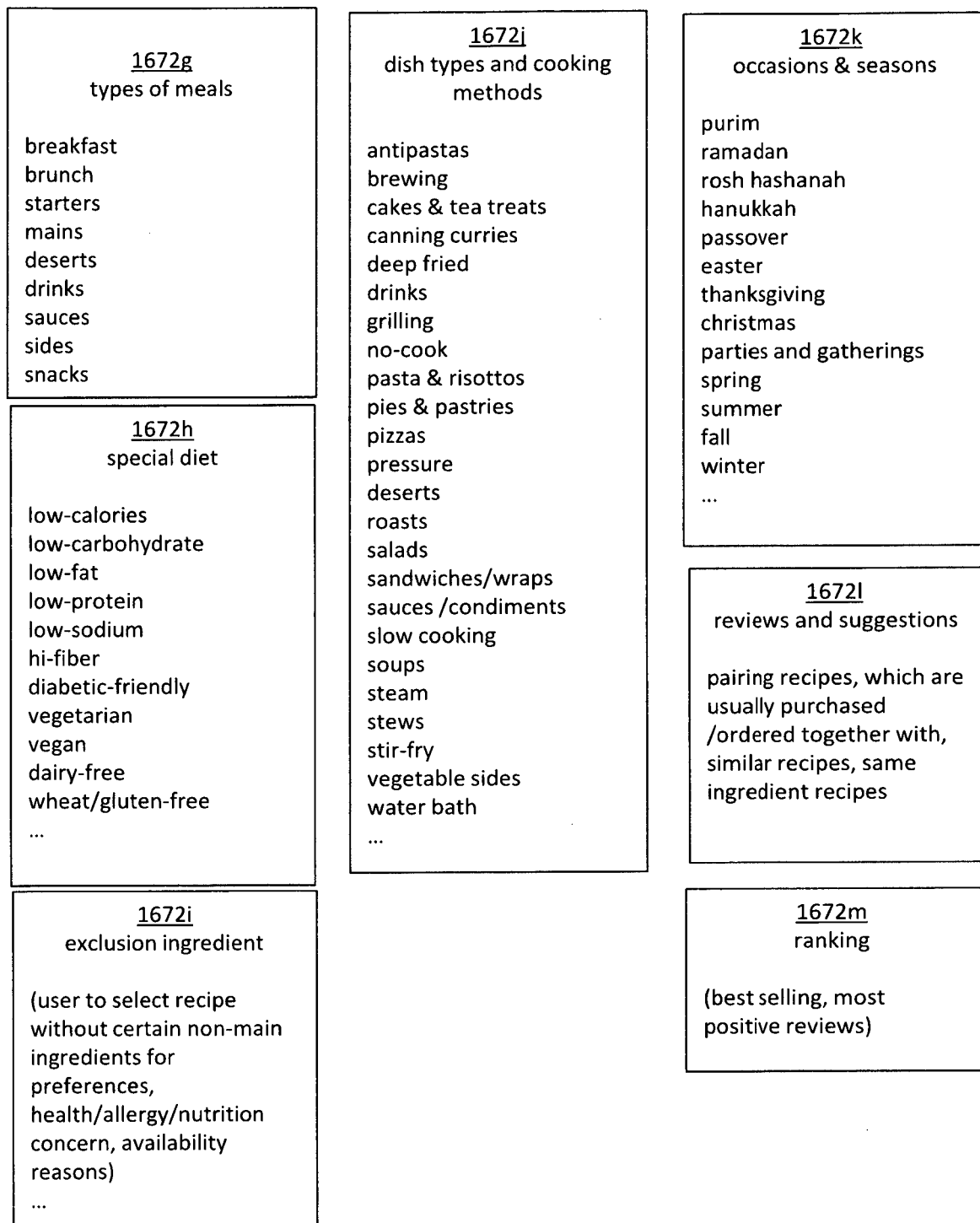
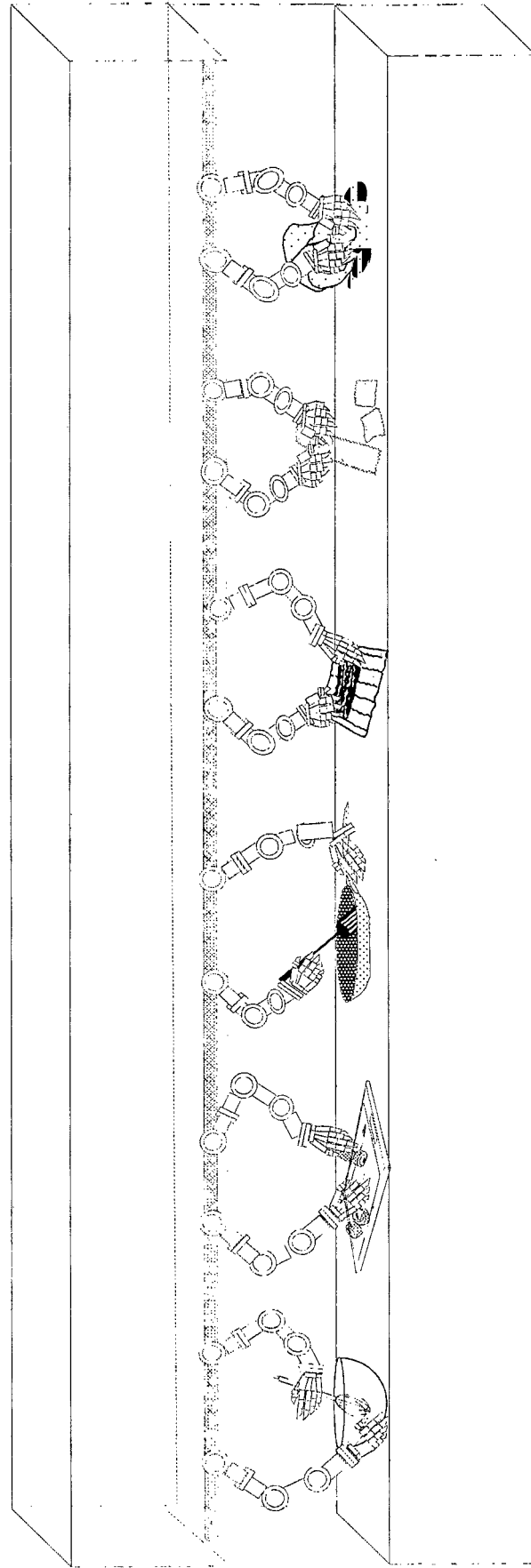
1672

FIG. 64B

type of product	product	container №	width x height x depth mm / volume ml
large, bulky products (used by the piece)	white cabbage, red cabbage, savoy cabbage, turnips, cauliflower, beet, rutabaga, kohlrabi, pak choi, chinese cabbage, cabbage Romanesco, pumpkin, watermelon, melon, pineapple, coconut, mango	№1	280x200x150
small fraction solids (small amount of use)	cocoa, coffee powder, baking soda, citric acid (crystals), poppy dried, powdered sugar, baking powder dough, anise, star anise, vanilla, cardamom, black cardamom, black cumin, coriander, cumin whole, dry dill, coriander seed, slices of dried onions, fennel seeds, dry yeast, sumac, cumin whole, dry thyme, garlic, dry mustard powder, minced cherries, rosehip powder, glucose, baking dough, egg powder, caramel syrup, dried parsley, gelatin food, basil dry, saffron, galangal, oregano, pepper (allspice, black, white, red, sweet, red hot chili, cayenne), cloves, cinnamon, coriander, salt (carbon ammonium, sea), minced cloves, ginger dry powder, cardamom, coriander, cumin powder, curry, turmeric, powdered cinnamon, nutmeg powder, parsley	№2	100x50x30 / 150 ml
small fraction solids (large amount of use)	flour (wheat, pancake, corn, rye, barley, oat, rice, pea, buckwheat, soybean), starch (corn, potato), semolina, millet, rice, oats, barley, corn, breadcrumbs, sugar	№3	70x100x150 / 1000 ml
large fraction solids (large amount of use)	rice (wild, basmati rice, long-grain, polished, brushed crushed), lentils, buckwheat, unground, unground quickly preparing, slipped quickly preparing, cereal (pea quickly preparing, corn ground, large corn for flakes, corn fine, wheat poltava, artek wheat, wheat quickly preparing, buckwheat, oats not crushed, oat rolled, crushed barley, crushed barley quickly preparing), oatmeal, oat flakes, millet polished, millet polished quickly preparing, pea (shelled, shelled split), beans (white, red), dried onion slices, dried parsley, food gelatins	№3	70x100x150 / 1000 ml
large fraction solids by piece (large amount of use)	pasta (linguine, spaghetti, lasagna, foam, feathers, scrap macaroni, vermicelli (round, square, elliptical), noodles (smooth, serrated, with straight, helical or sawtooth edges), pasta, pretzels, and noodles may be in the form of nests and coils, curly, stamped, pressed), gelatin leaf, sugar-dough (mastic)	№4	250x180x100
salad and spinach vegetables	salad, nettles, chard, spinach, quinoa, sorrel, etc., spicy vegetables - fennel, coriander, cumin, parsley, savory, calendula, basil, tarragon, lavender, lemon balm, thyme, rosemary, lovage, marjoram, etc., dessert vegetables (rhubarb, asparagus, artichoke, leek, onion, shallot, shallots; leek, rhubarb, sorrel)	№4	250x180x100
small size food products	tomatoes, onions, garlic, brussels sprouts, root and tuber vegetables (carrot, radish, black radish, horseradish, European radish, parsnip, daikon, celery, beets, potatoes, Jerusalem artichokes, sweet potatoes, yams); Pumpkin vegetables (cucumbers, marrow squash, zucchini, squash); herbaceous plants (corn on the cob, eggplant, capers, loofah, peppers (bell), fennel); fillets treated, bird (turkey, chicken, duck, partridge, quail, hazel grouse); seafood (shrimp (tiger), crab, squid, langouste, langoustines, lobster, mussels, scallops, octopus, oyster, cuttlefish); meat (pork, beef, rabbit, mutton, lamb, veal, goat meat, horse meat, hare, venison, wild boar meat); fish (ide, pike, hake, trout, tuna, silver carp, cod, perch, sterlet, jack mackerel, catfish, mackerel, whitefish, salmon, herring, sardines, baltic herring, Common carp, roach, haddock, halibut, sturgeon, perch, hake, redfish, capelin, pollock, bluefish, bream, smelt, mullet, chum salmon, carp, crucian, flounder, catfish, dorado, pink salmon, chub, red mullet, anchovy, shark, sea bass); mushrooms (cep, oyster, table mushroom, portabello, milk mushroom, chanterelle, suillus, xercomus, armillaria, birch bolete, red-capped scaber stalk, truffle, shiitake); chicken egg; fruits, apple, pear, pomegranate, peach, plum, cherry, orange, lemon, grapes, apricots, kiwi, strawberry, banana, feyhua, grapefruit, lychee, rambutan, mangosteen, carambola, guava, passion fruit, avocado, papaya, pomelo, figs, pawpaw, quince, barberry, cranberries	№4	250x180x100
large fraction solids by piece (small amount of use)	dried apricots, raisins, (dark, light), prunes, almond shavings, seeds (sunflower, pumpkin, white), dates, figs, dried cherry, dried, dried plums, dried rosehip, dried apricots pitted, dried papaya, dried apricots, kiwi dried, candied pineapple, quail eggs, blueberries, strawberries, blackberries, currants (red / white / black), cranberry viburnum, buckthorn, gooseberry, butter	№5	150x100x50
large fraction solids by piece (small amount of use)	nuts (nutmeg, pecans, pine nuts, macadamia, cola, chilim, chestnut, Brazil, peanuts, walnuts, almonds, cashews, pistachios, pine, hazelnuts), coffee grain, sugar (cane, white refined) grains for milling	№6	70x100x150 / 1000 ml
Spaghetti	spaghetti	№7	tube 100x100x350
Liquids (large amount of use)	milk, cream (pastry, vegetable), liquid dairy products (fermented baked milk, yogurt, kefir, tan), olive oil, vegetable oil, frying, duck fat, stewed fruit, fruit-drink, juice, beer, wine	№8	1200 ml
Liquids (small amount of use)	balsamic cream, vinegar (balsamic, (light, dark), wine-(white, red), apple, table), soy sauce, citric acid, Tabasco, Red Devil, Worcestershire sauce, oil (pumpkin, flax, sesame)	№9	100 ml
Pasty (pastelike) products and semi-finished products (small amount of use)	sour cream, mayonnaise, softened butter, whipped cream, cheese (mascarpone, ricotta), tomato paste, mustard, horseradish paste	№10	300 ml

FIG. 65



1676

FIG. 66

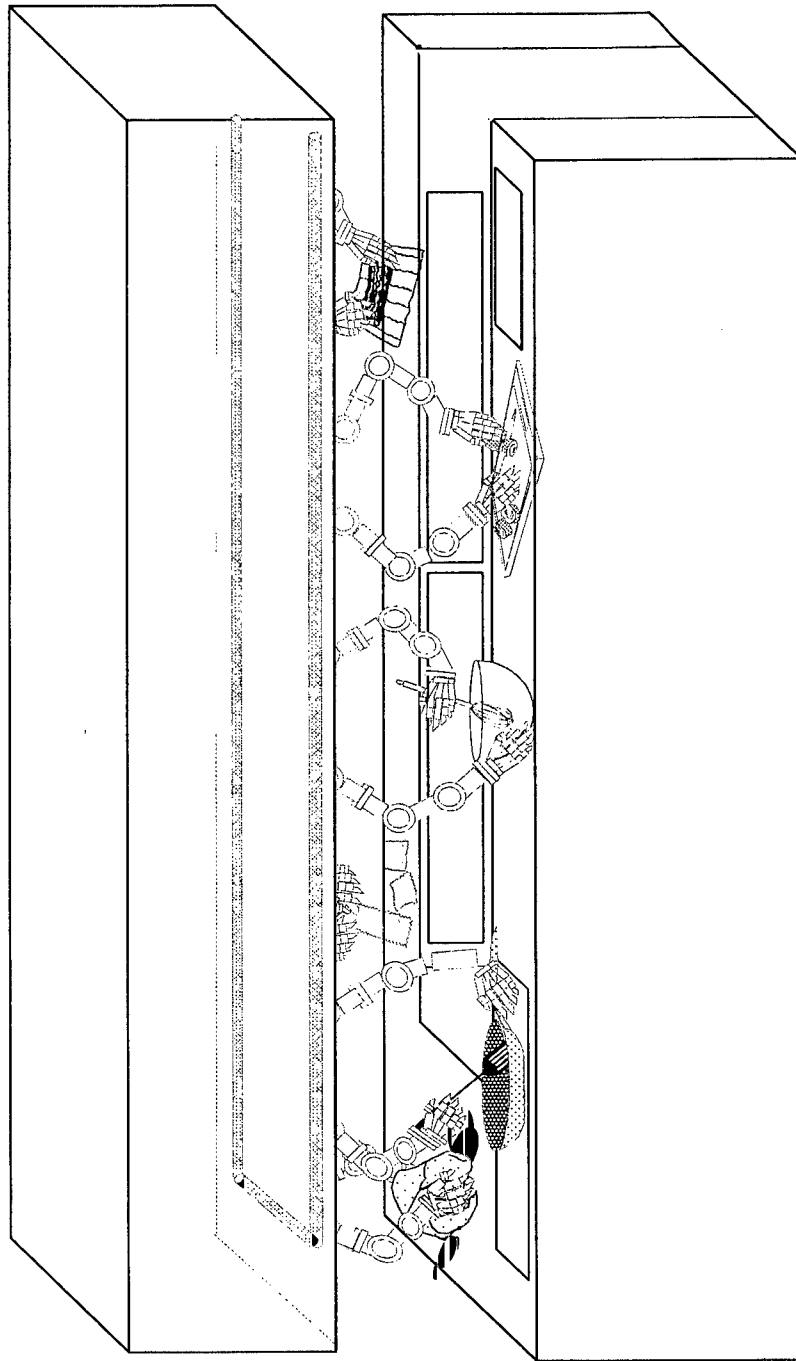


FIG. 67

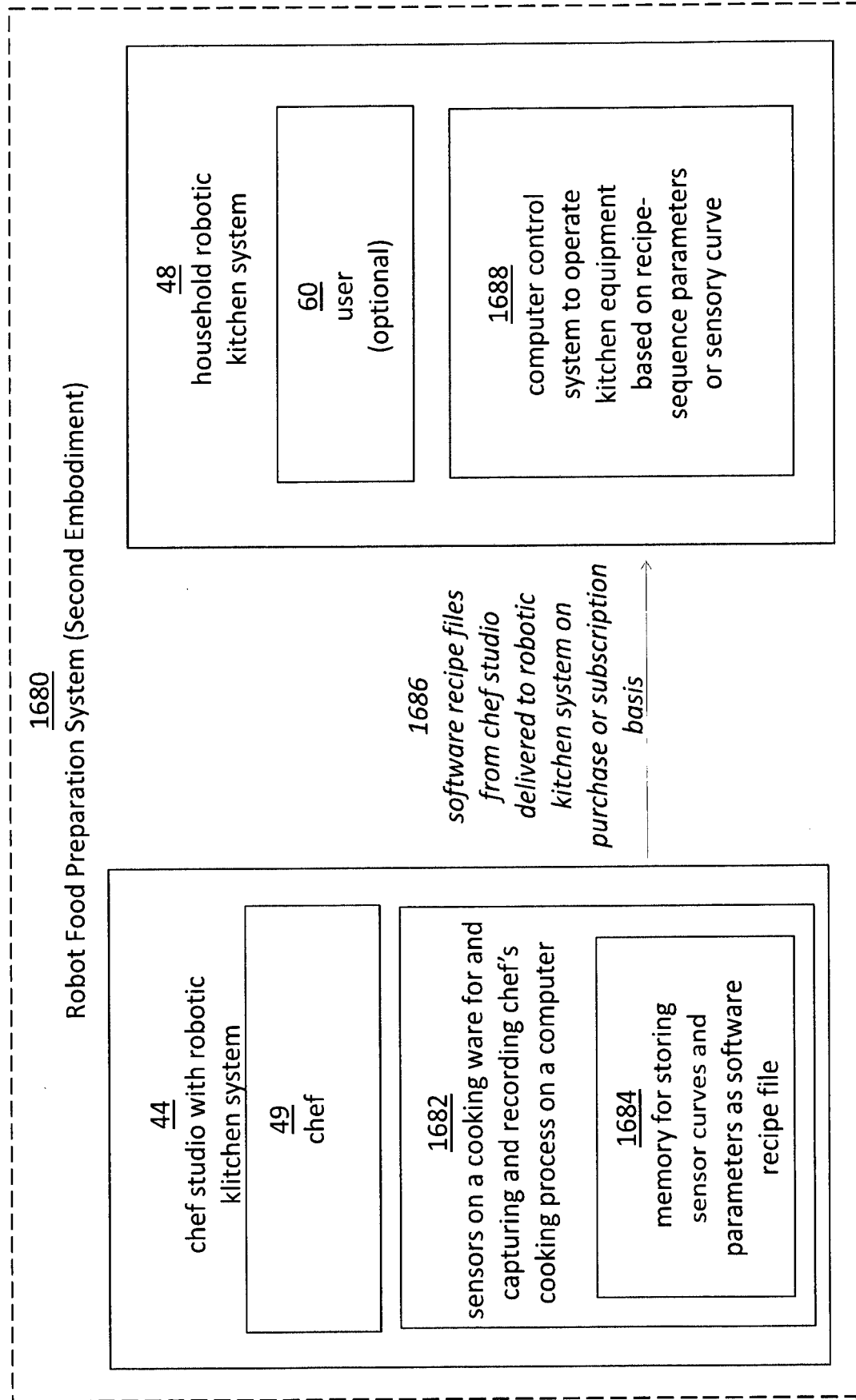


FIG. 68

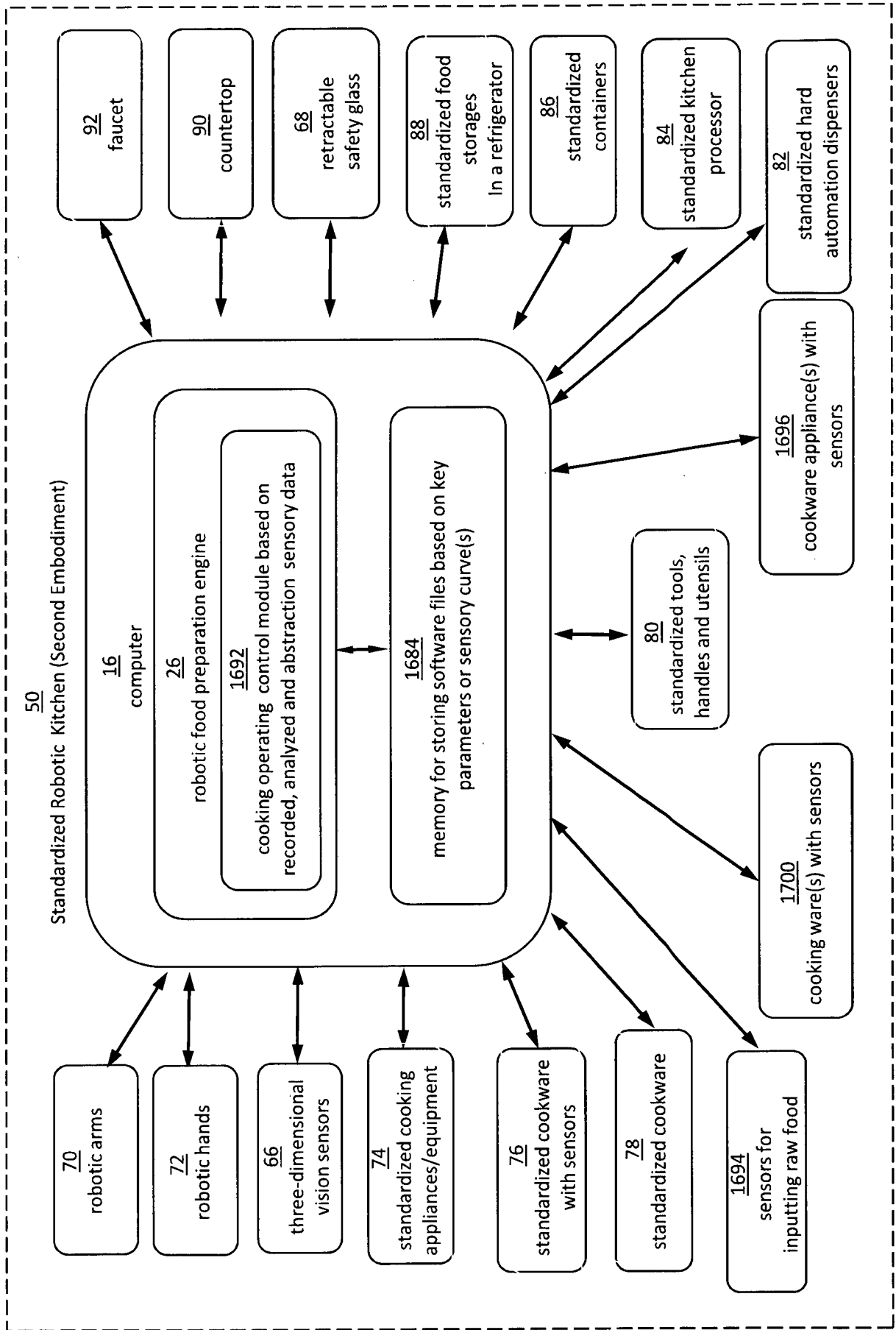


FIG. 69

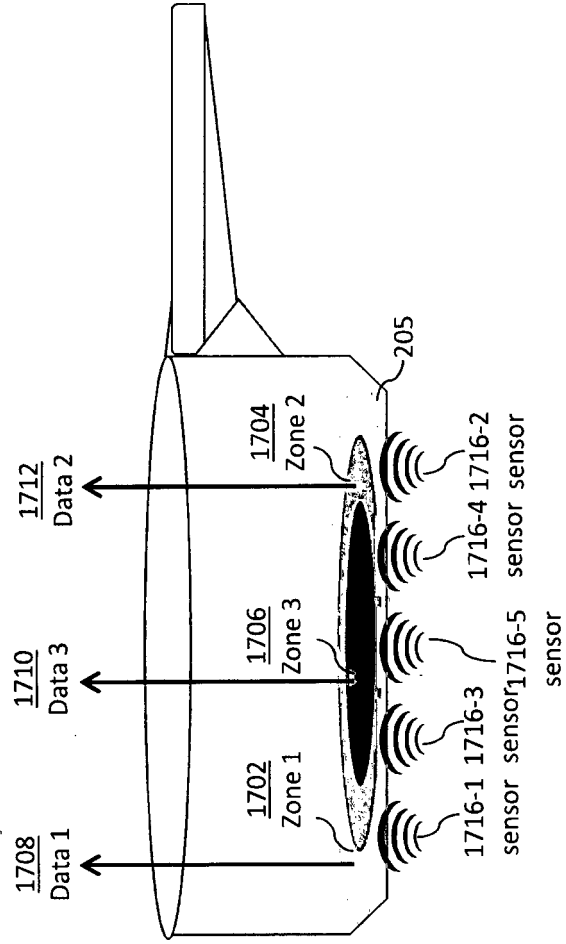
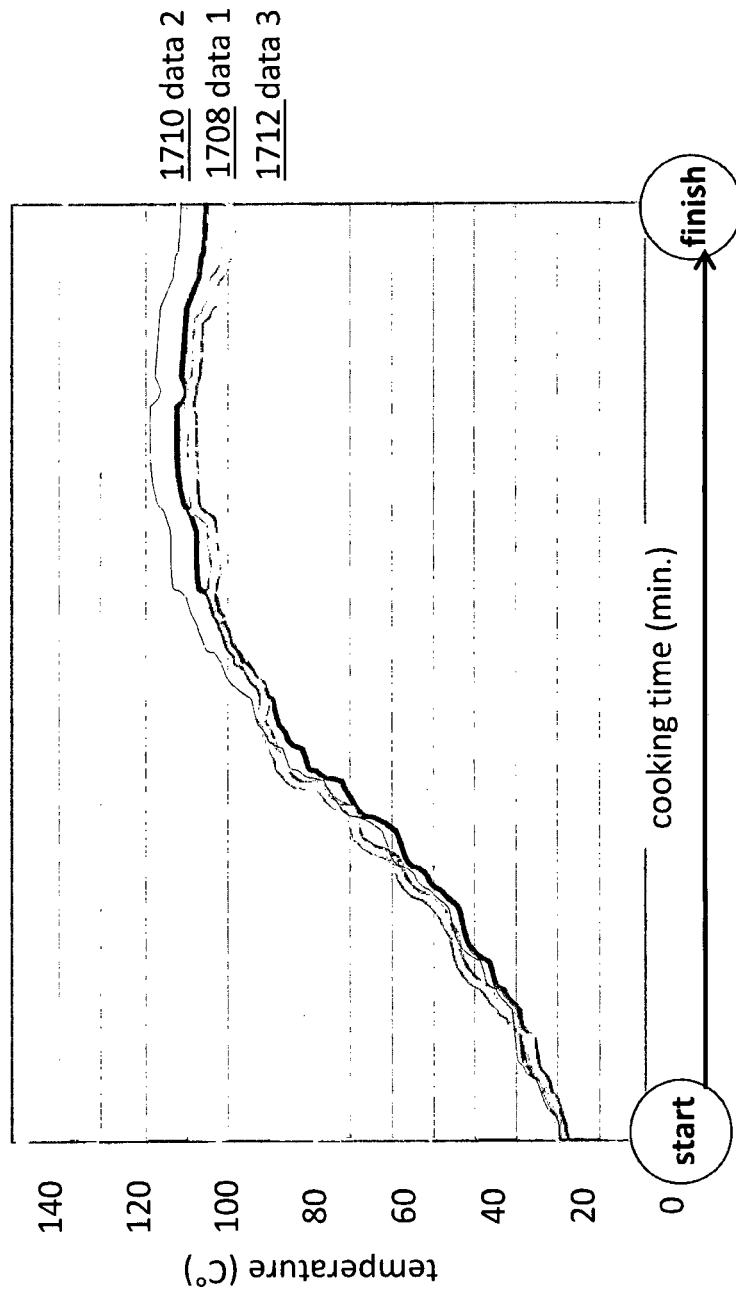


FIG. 70

1700



1718

FIG. 71

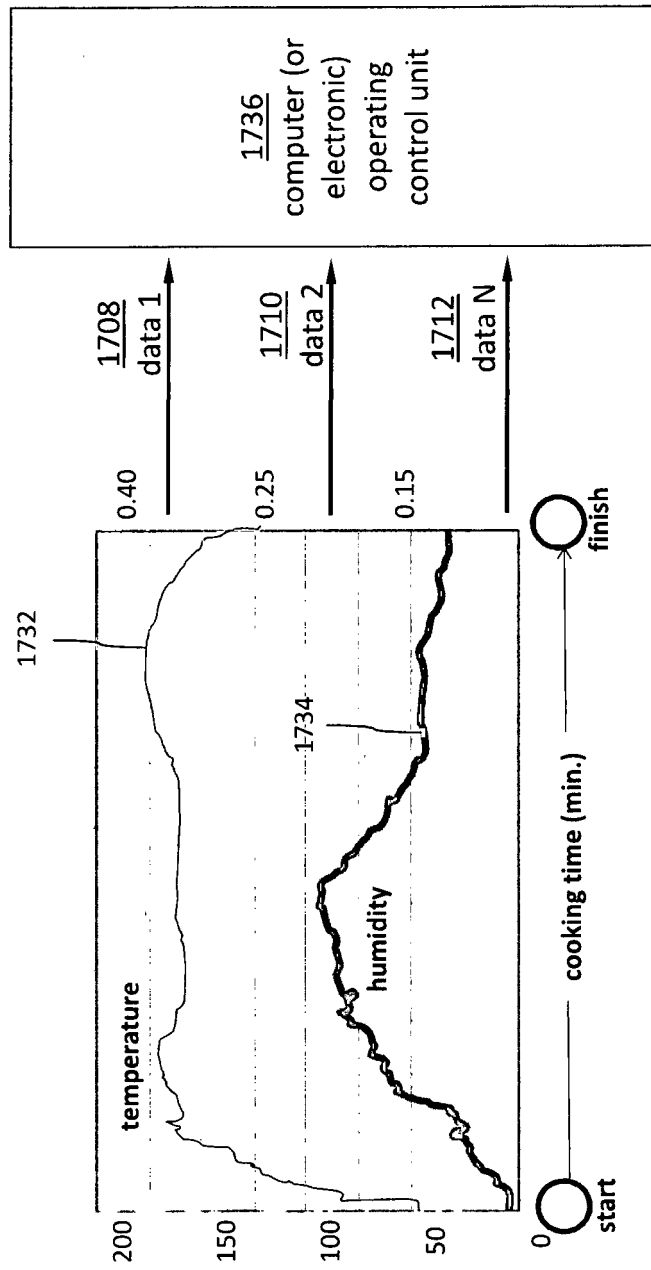


FIG. 72

1730

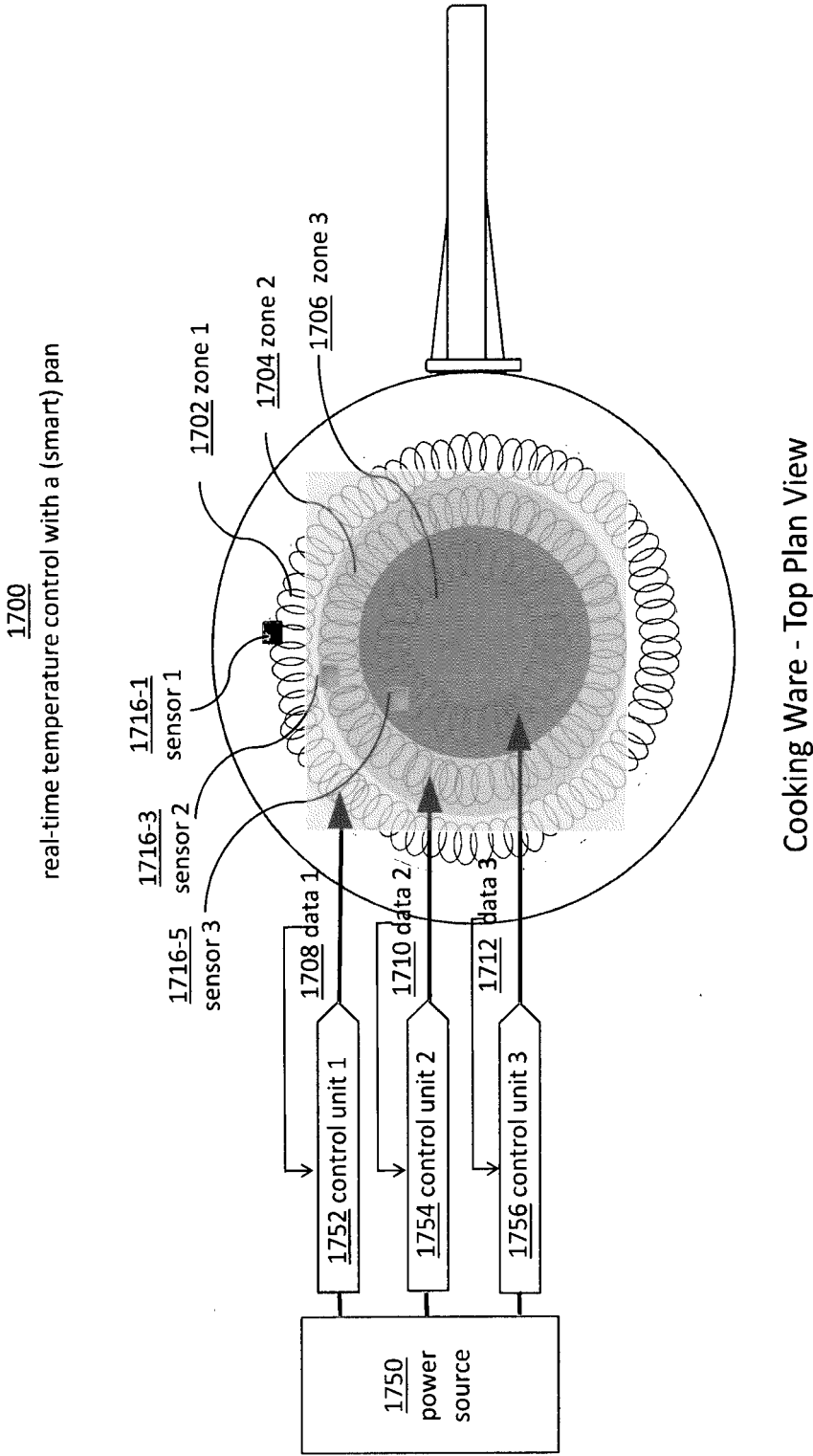


FIG. 73

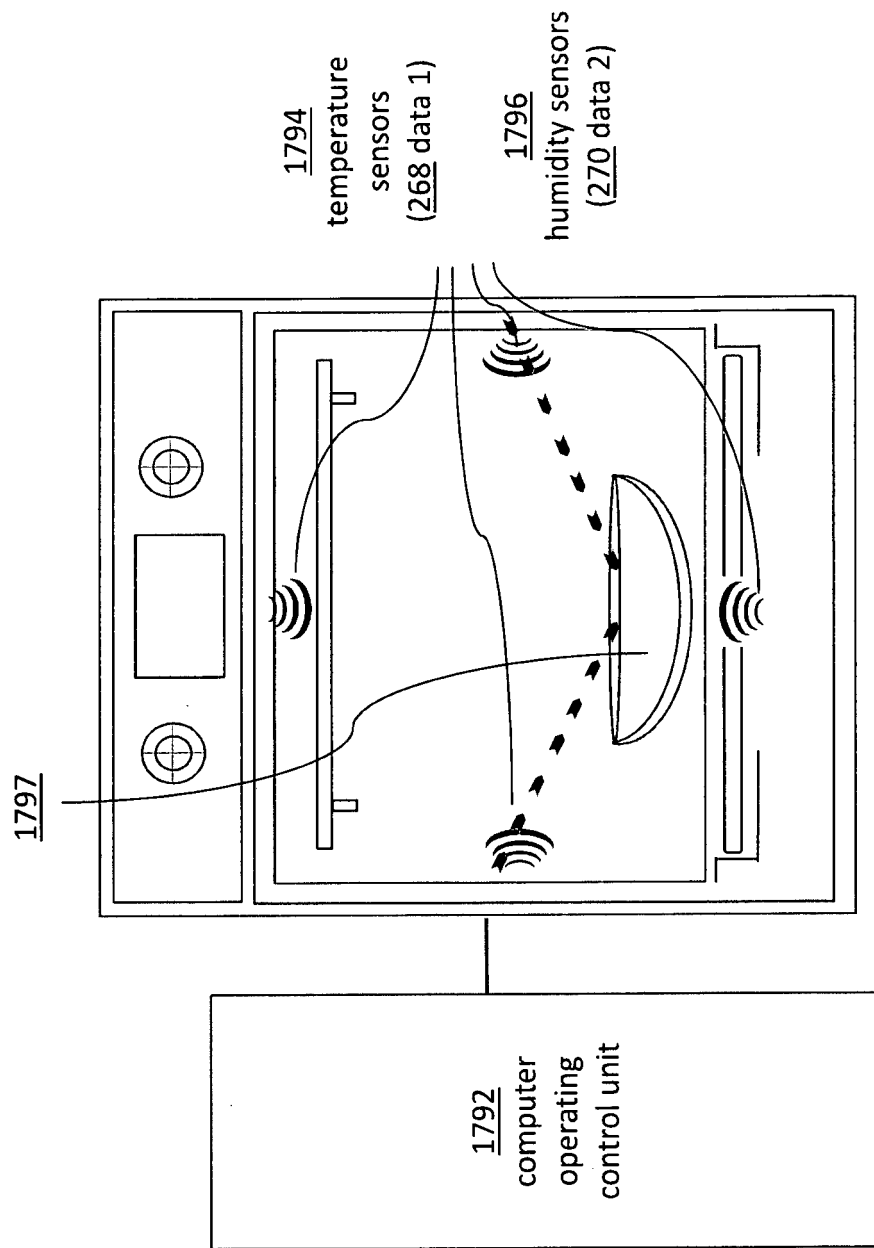
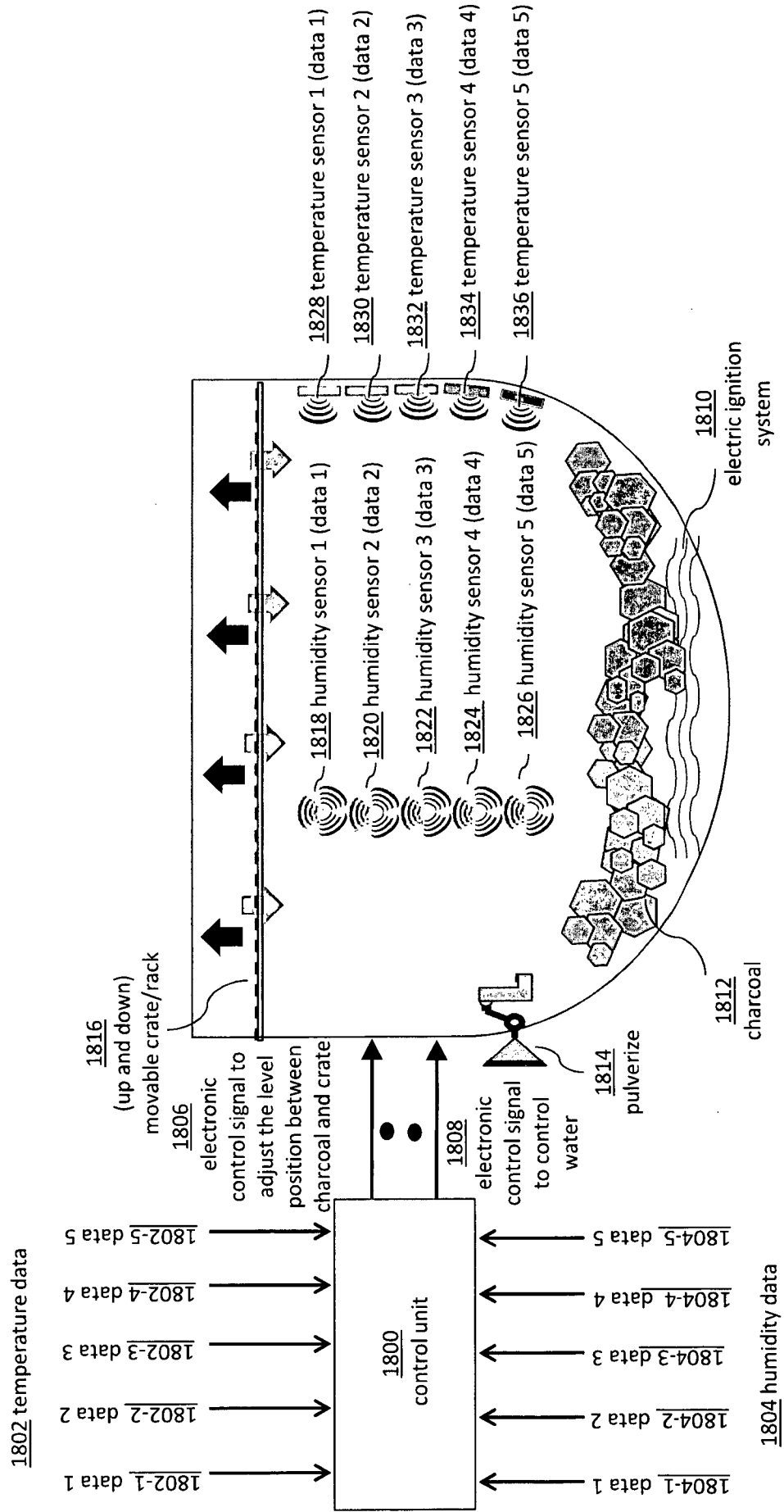


FIG. 74

1790



1798

FIG. 75

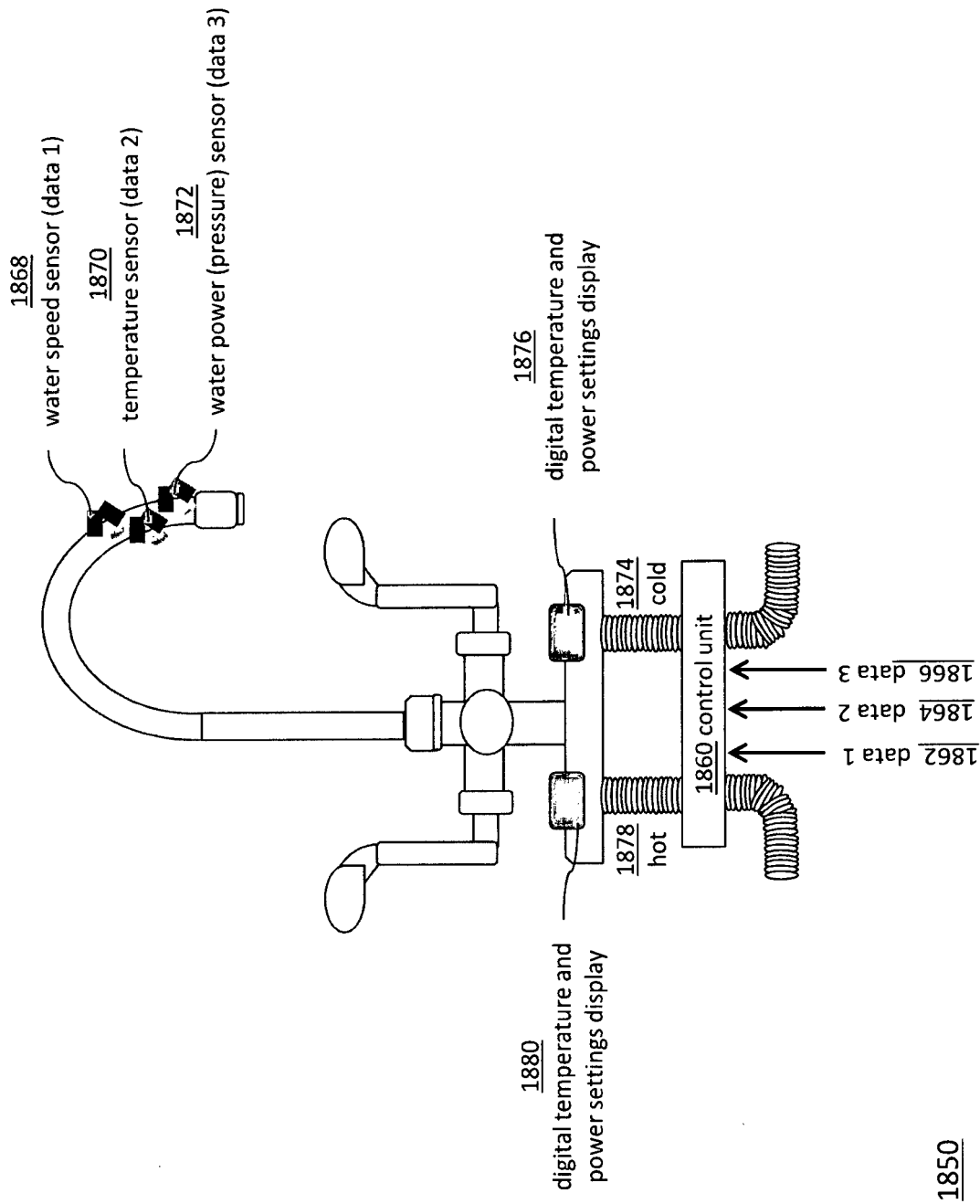


FIG. 76

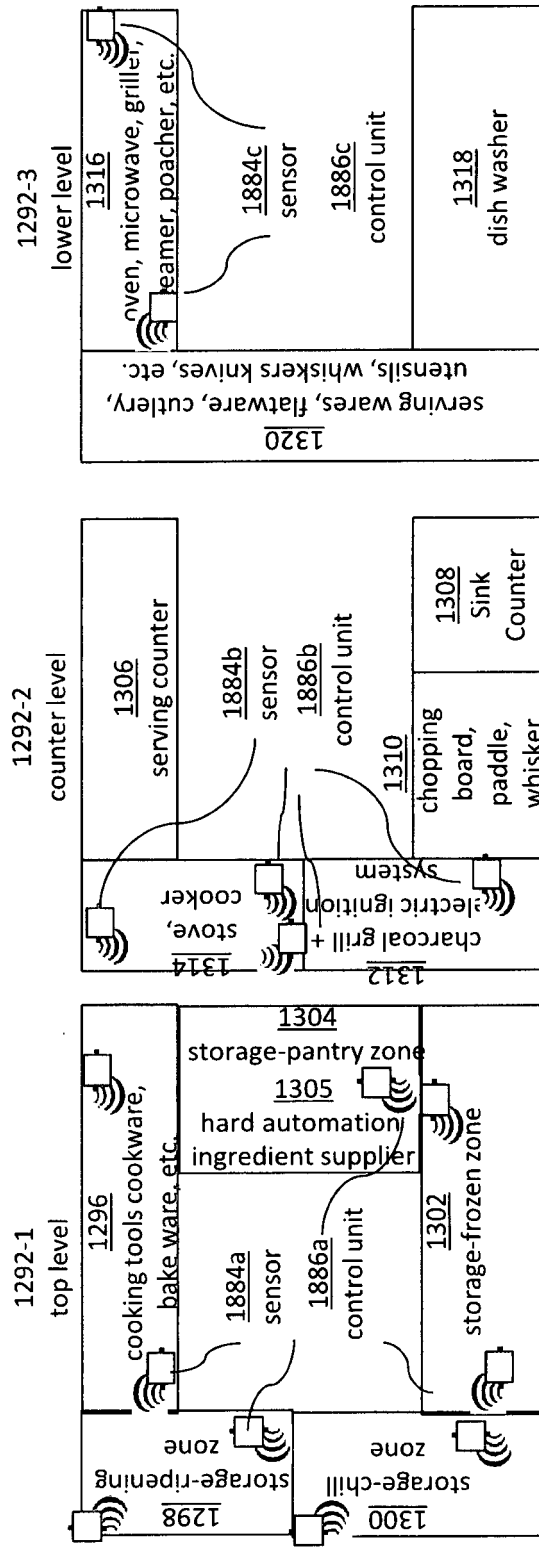


FIG. 77

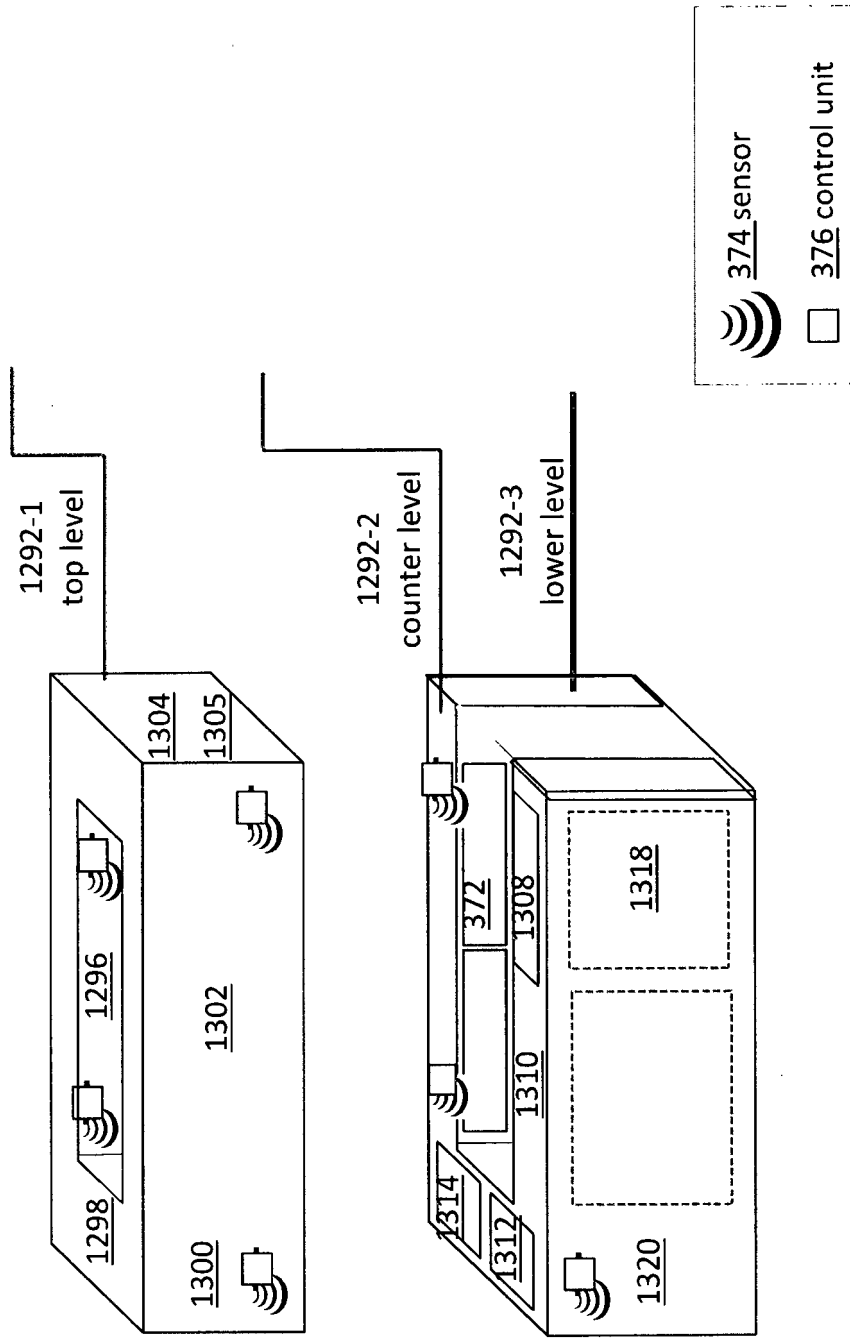
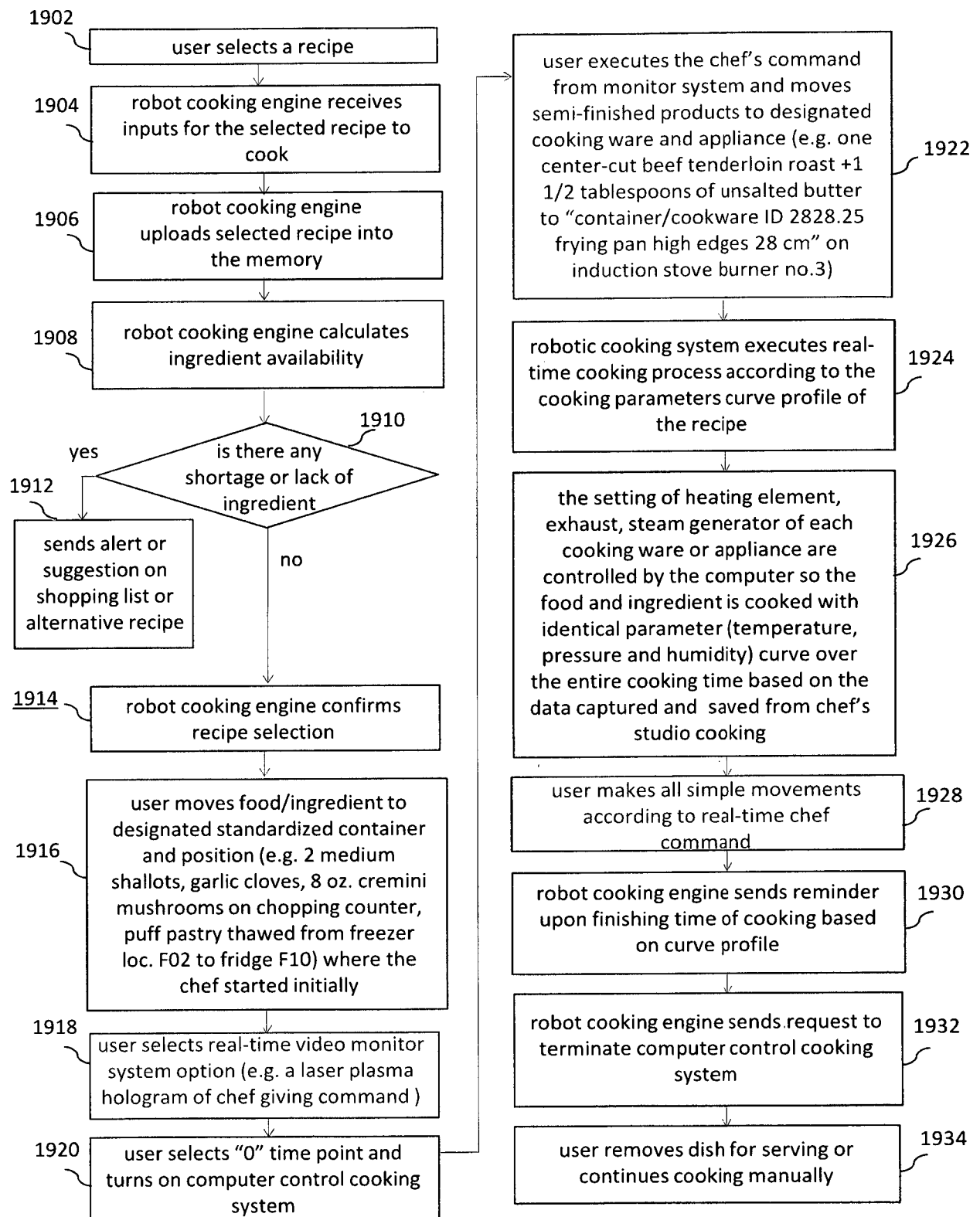


FIG. 78



1900

FIG. 79

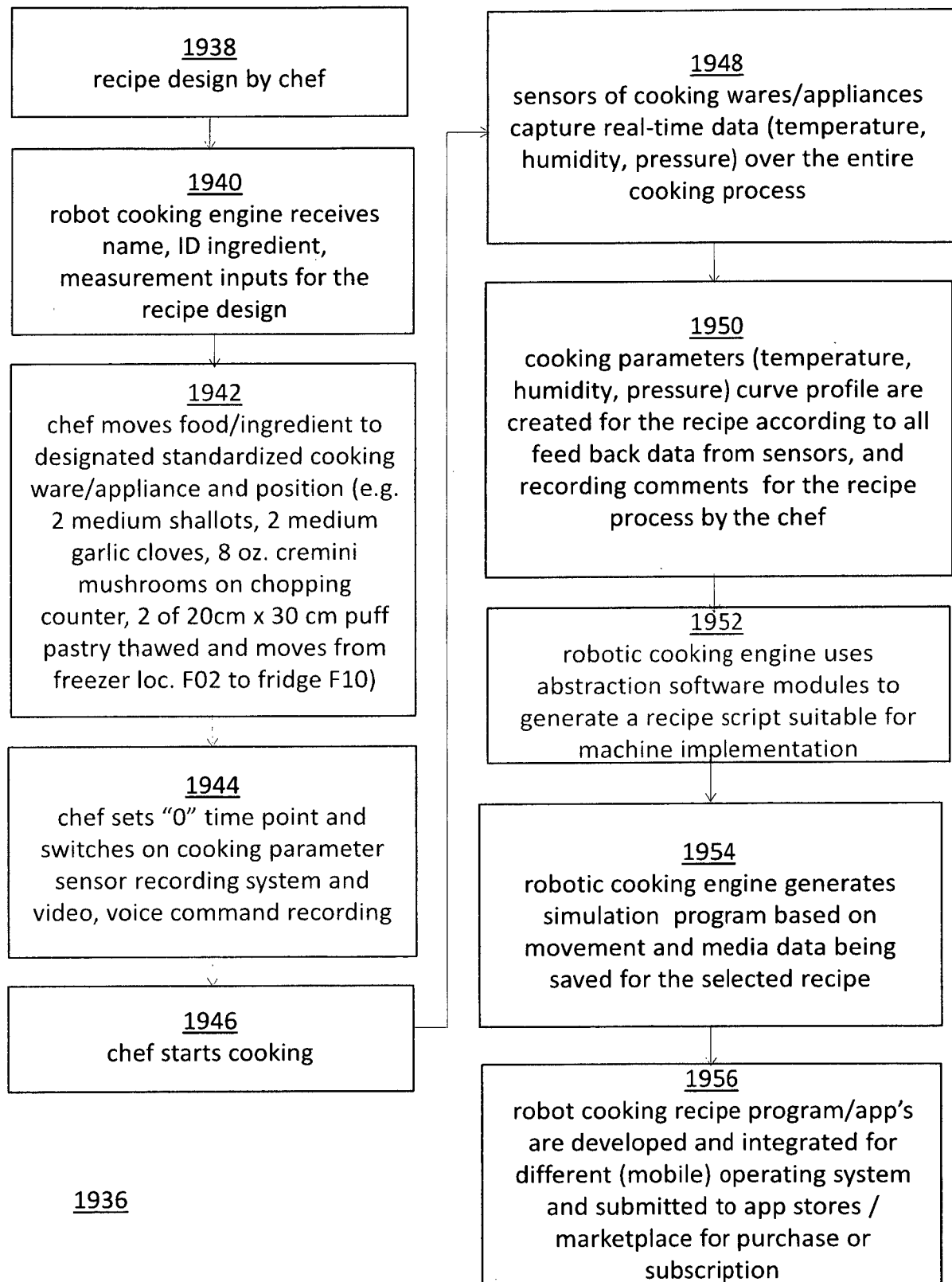


FIG. 80

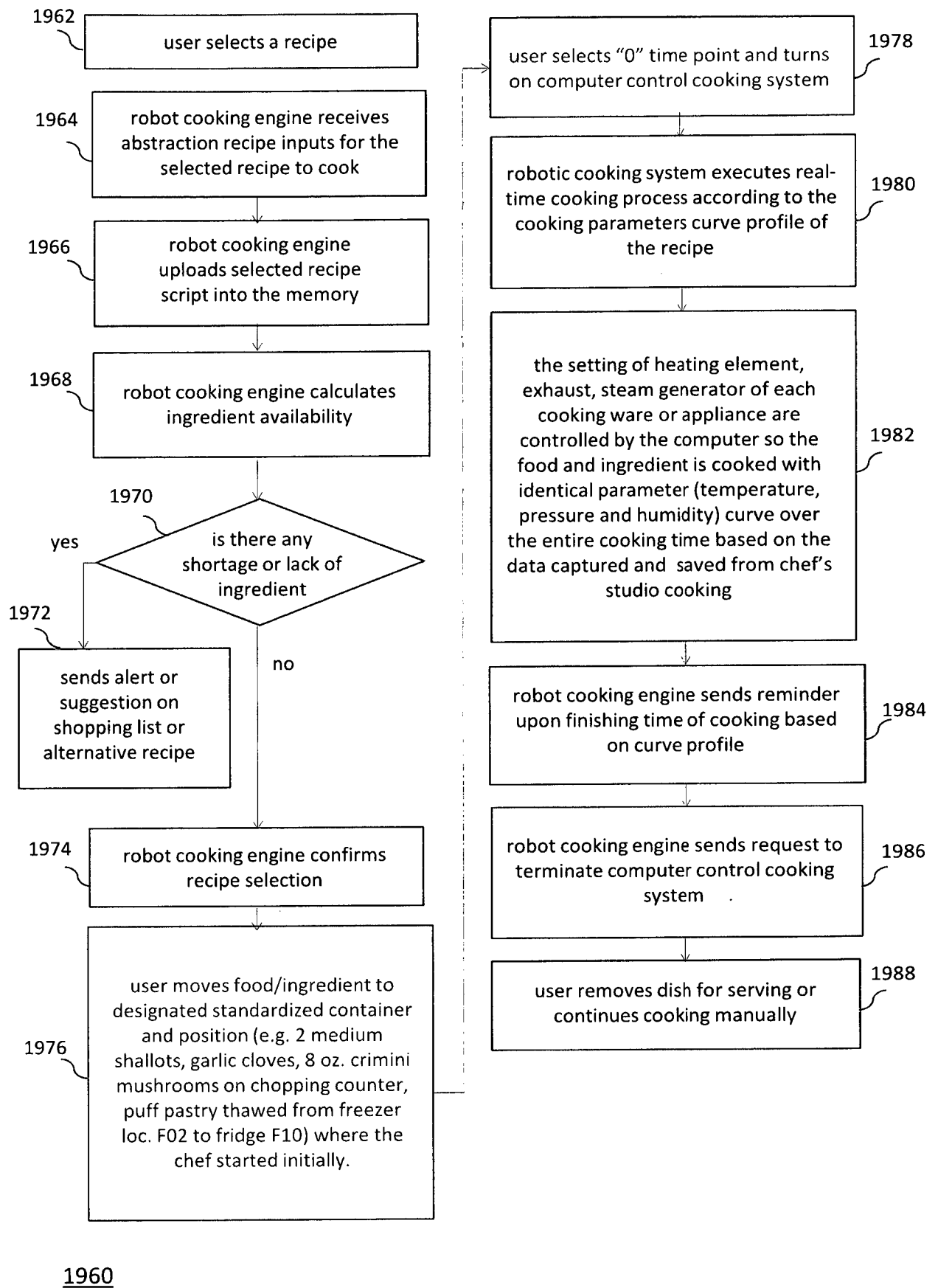


FIG. 81

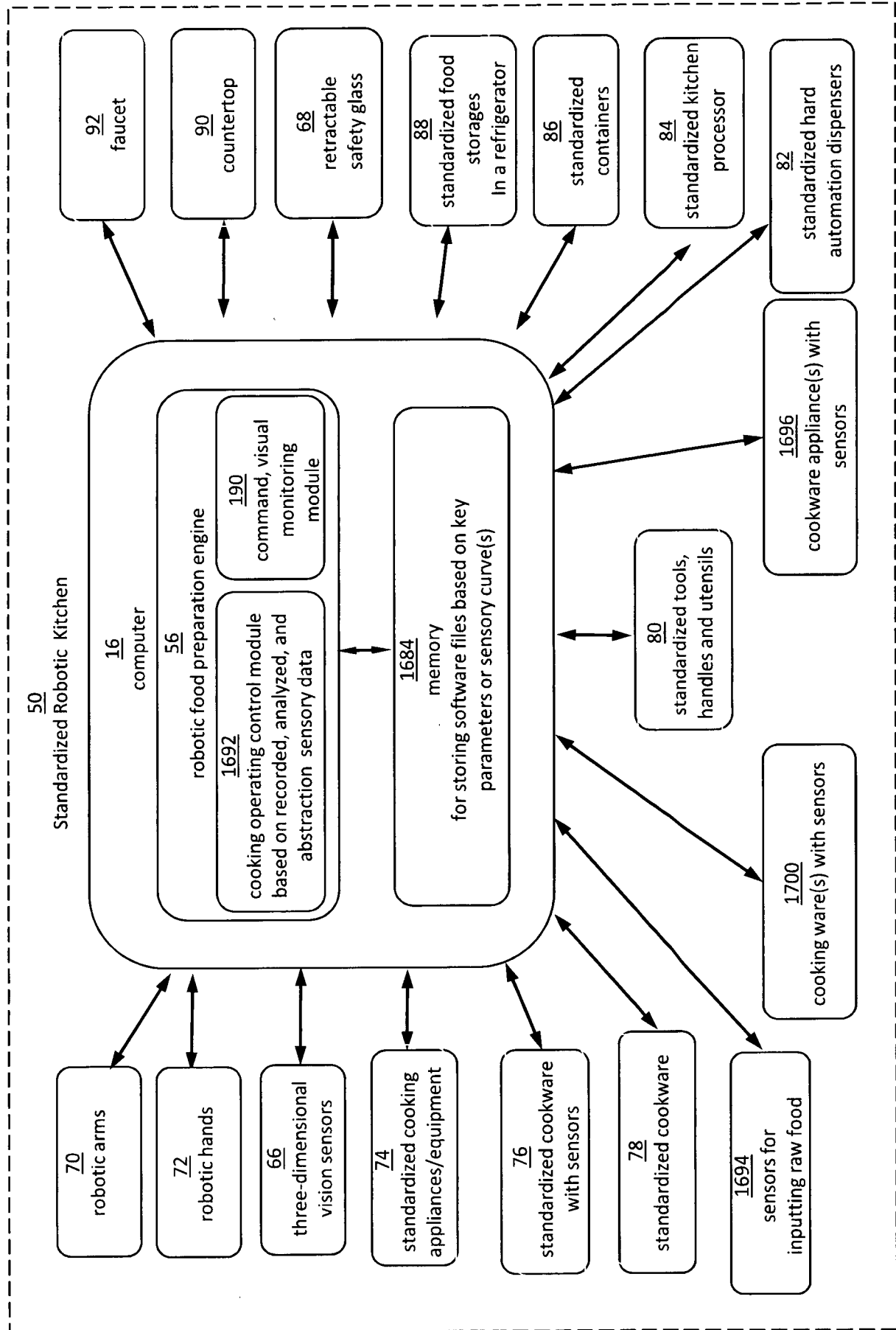
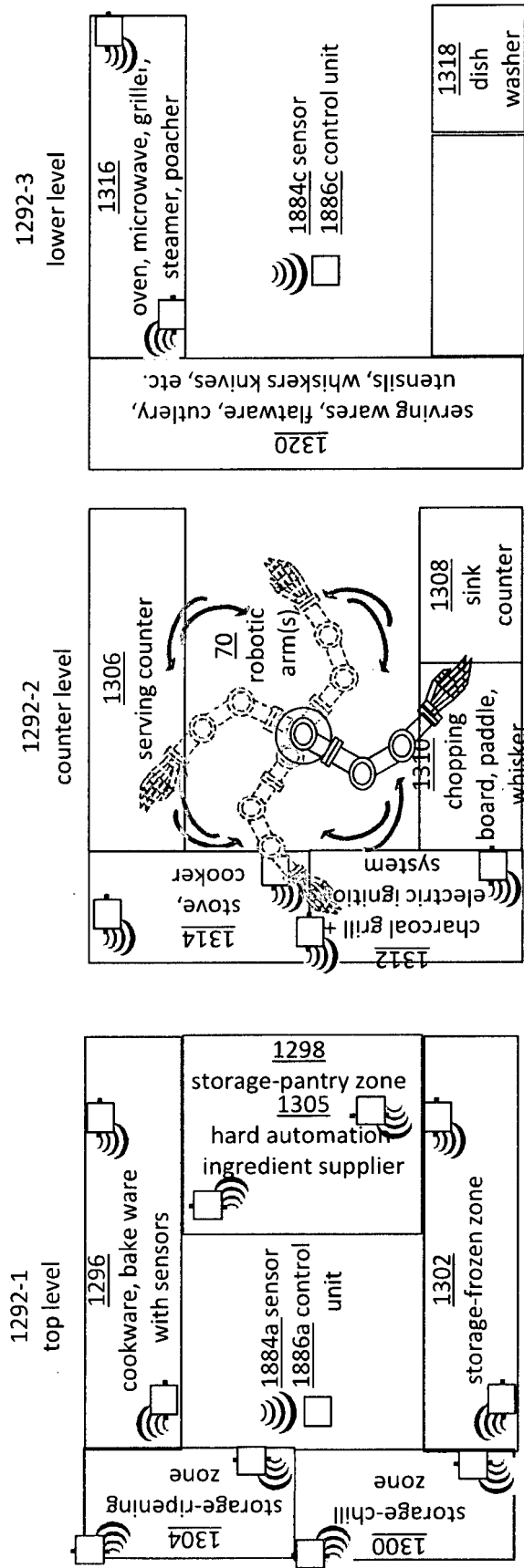
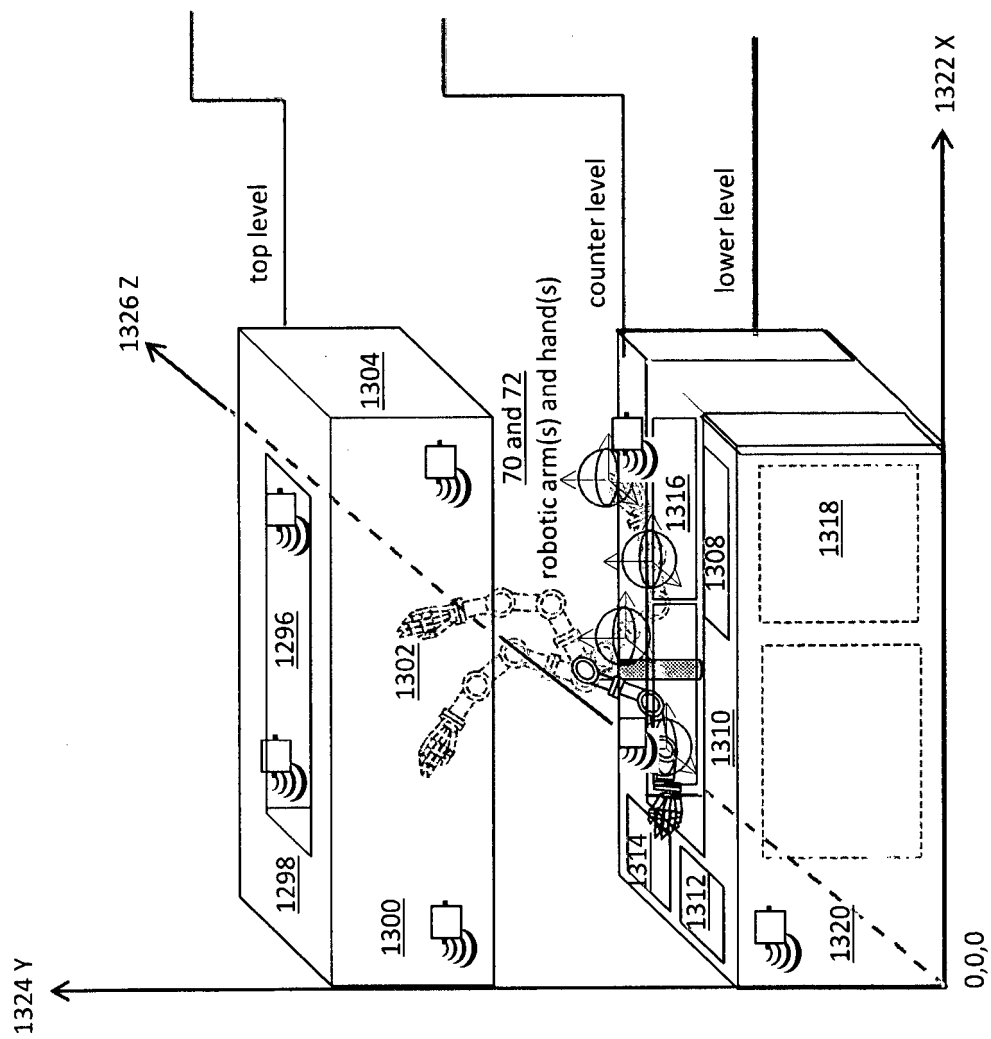


FIG. 82



2000

FIG. 83



2000

FIG. 84

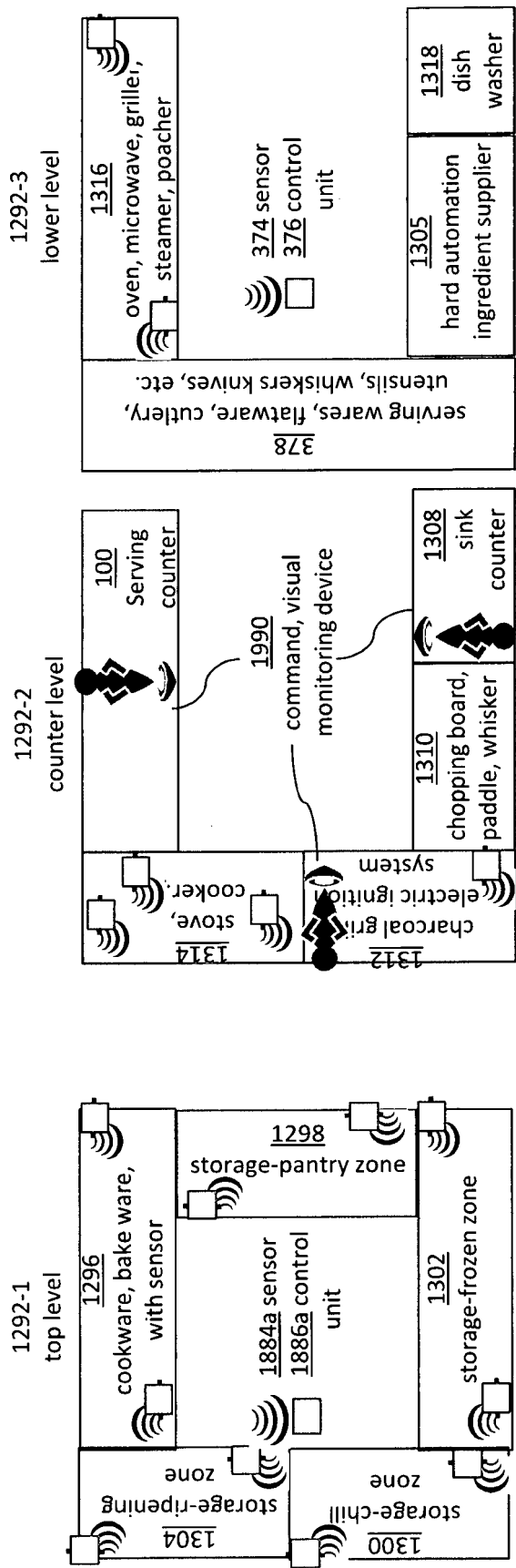


FIG. 85

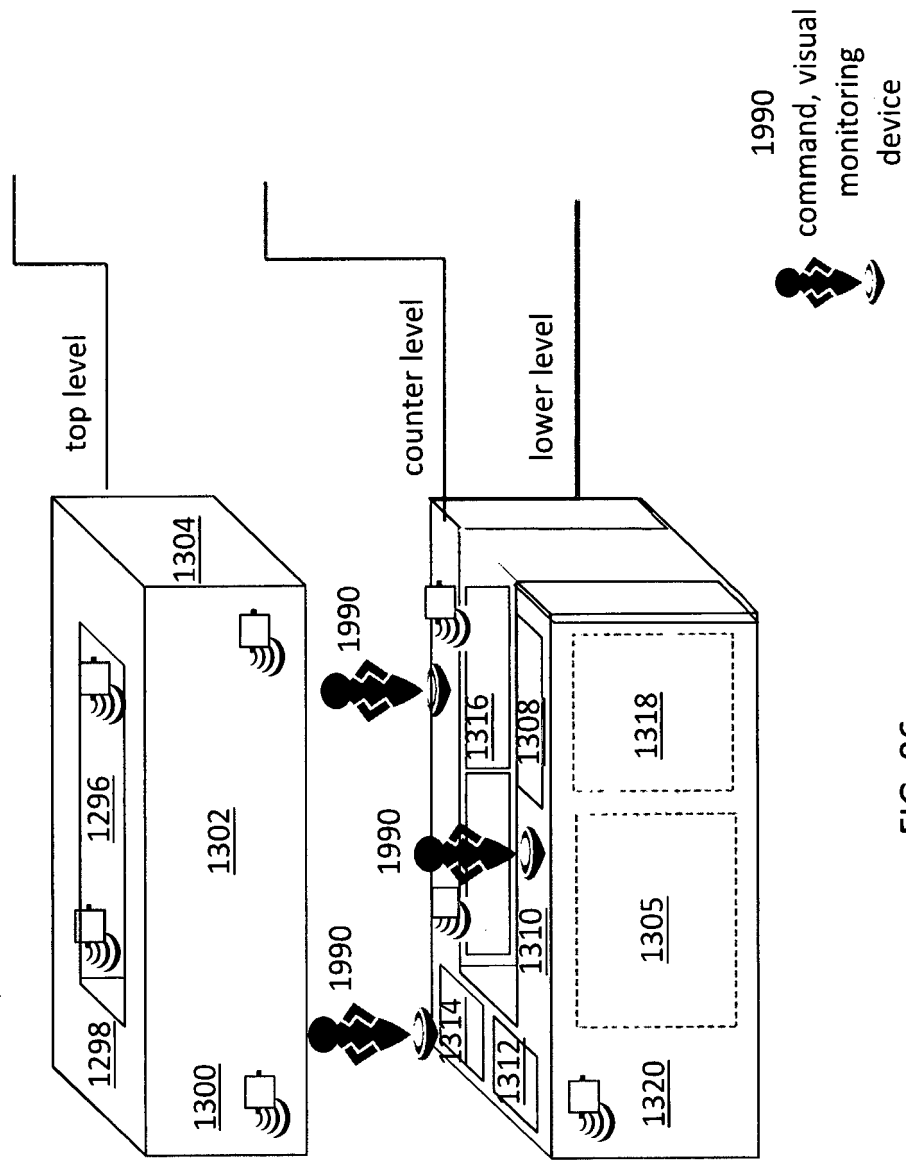


FIG. 86

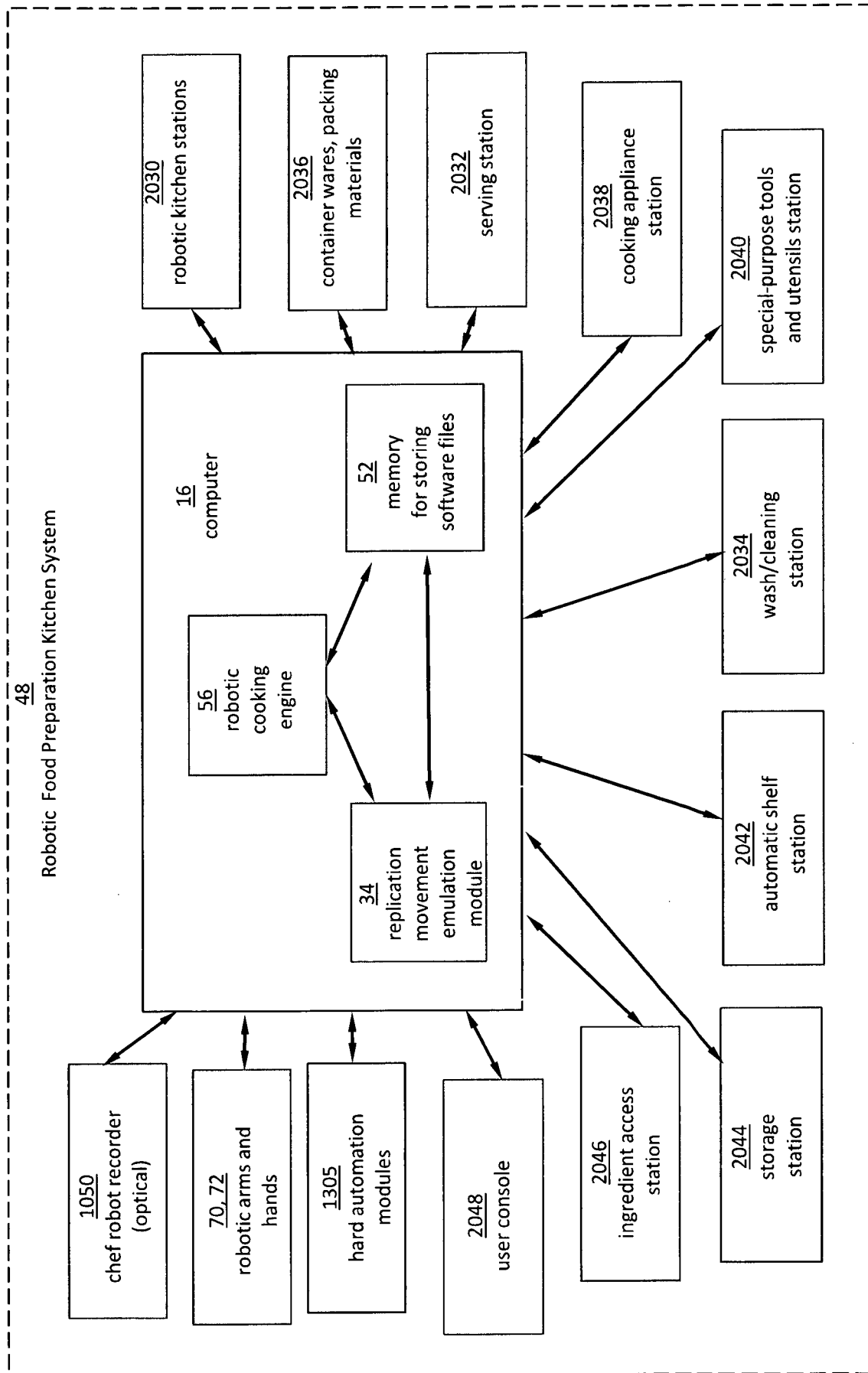


FIG. 87A

2064 user/chef console: interface to schedule dish(es) and have personal setting, overview, and manage recipe

2066 ingredient access station (scanner, camera, sensor, packing line, recycling to inspect, identify, pack and dispose food/ingredient, and move item to designated storage zone)

2062 storage station: different storage areas with different temperature sensors and control (e.g. deep freeze, frozen, chill and other setting for humidity, pressure, light, oxygen, sterilization control and best stability on food/ingredient)

2068 automatic shelf station (for cookware's, bake ware's, container, packing material, table ware, serving ware, dinning ware to be moved automatically for easy access)

2070 wash/cleaning station; control sink, dishwasher, appliance self-cleaning

2072 technique tooling station (to use blade, knife, paddle, whisker, juicer, opener, shear and apply cooking techniques with tooling assembly)

2076 cooking appliance station (oven, stove, griller, steamer, fryer, microwave, dehydrator, range/cooker, blender)

2074 serving station (warmer, cooler, airy)

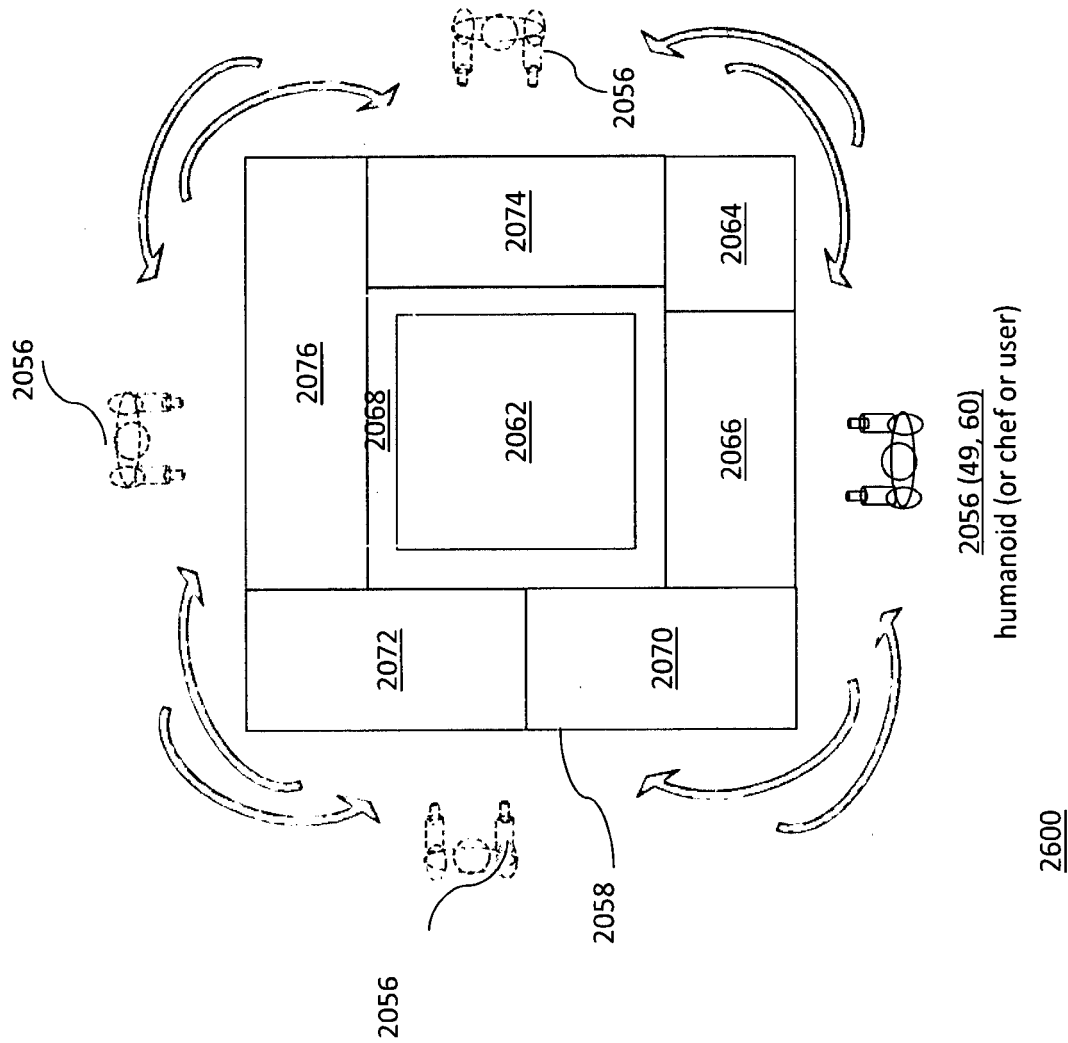


FIG. 87B

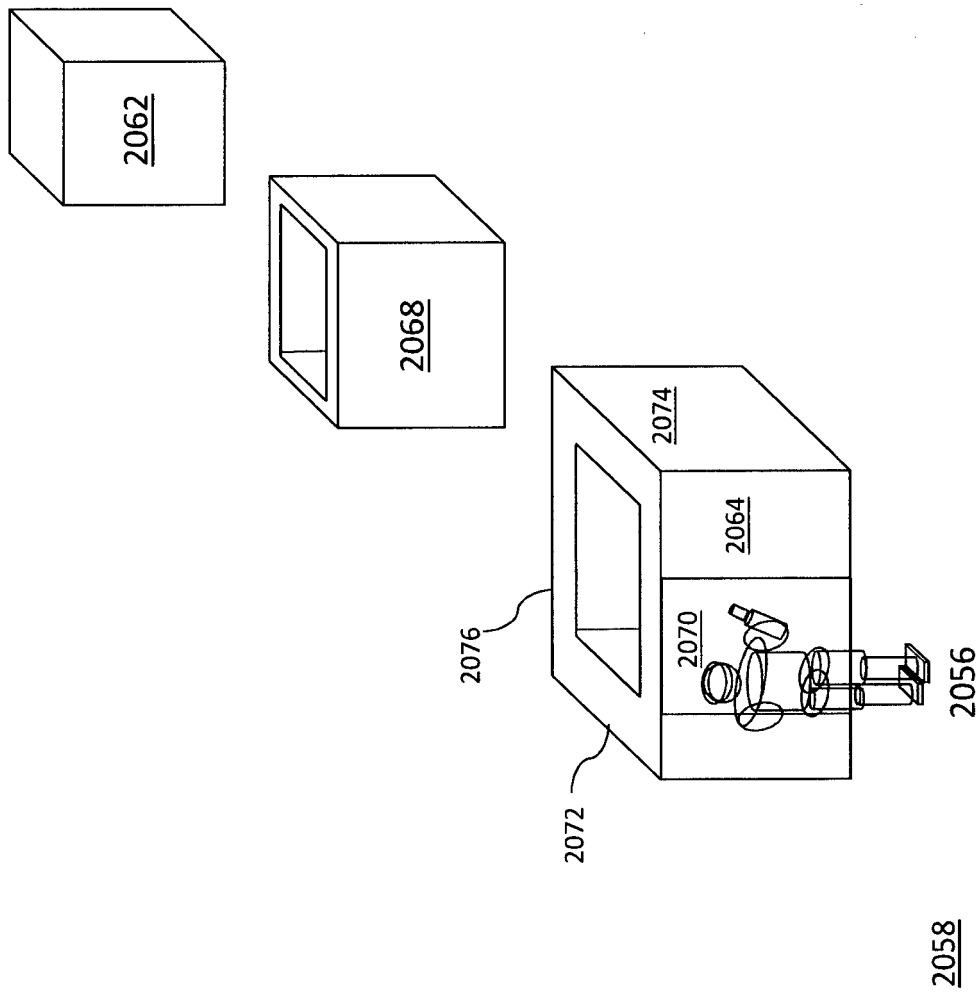


FIG. 87C

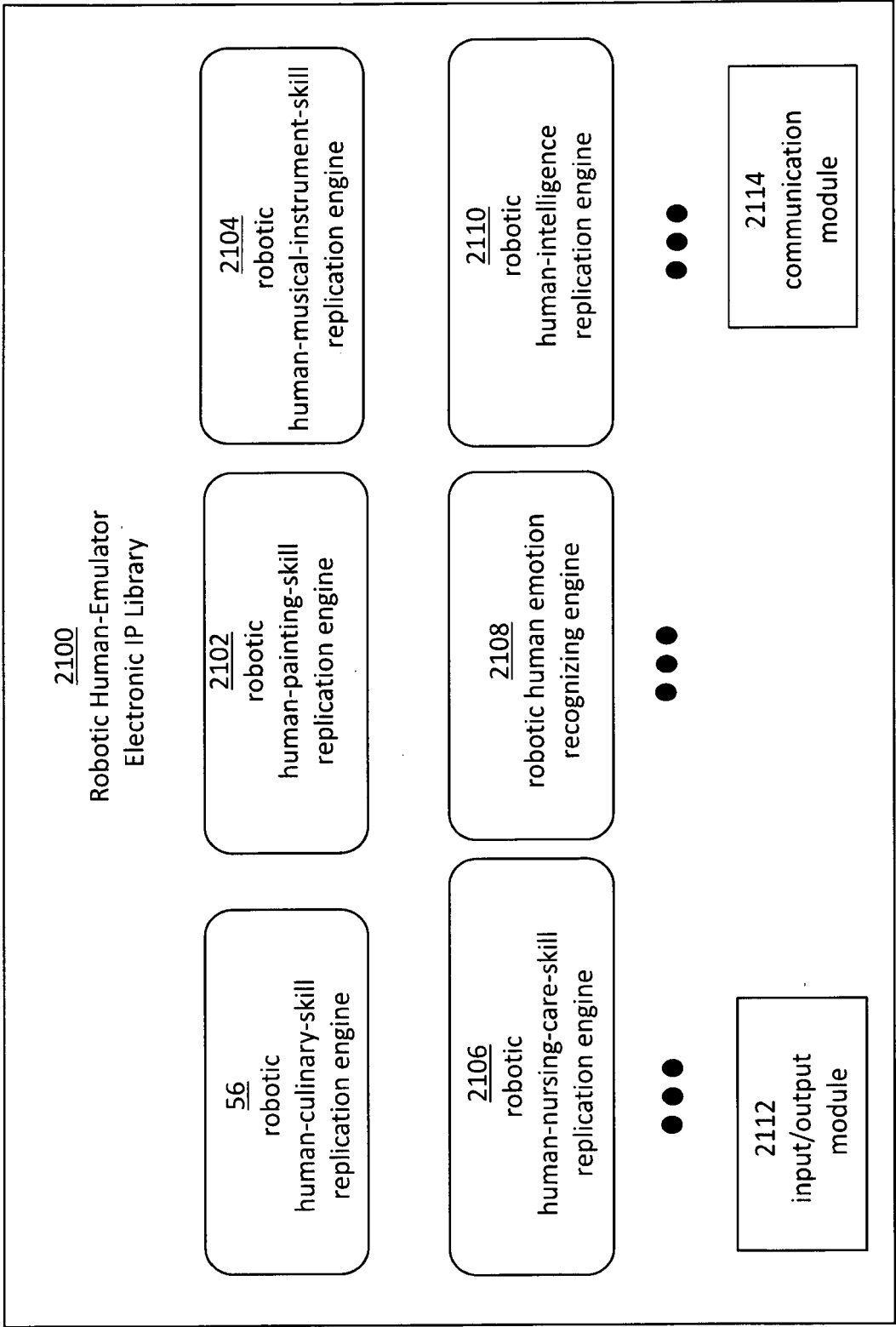


FIG. 88

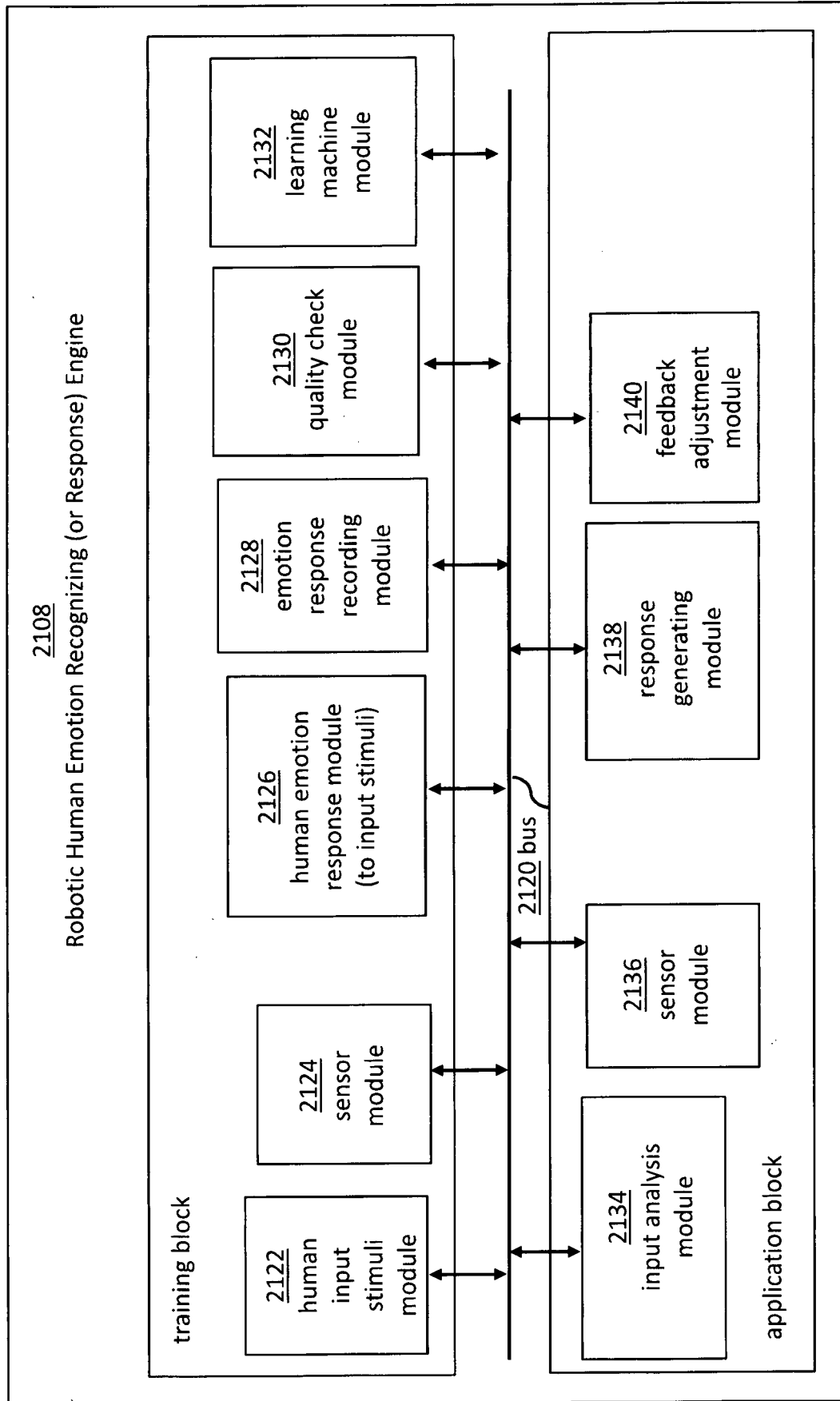


FIG. 89

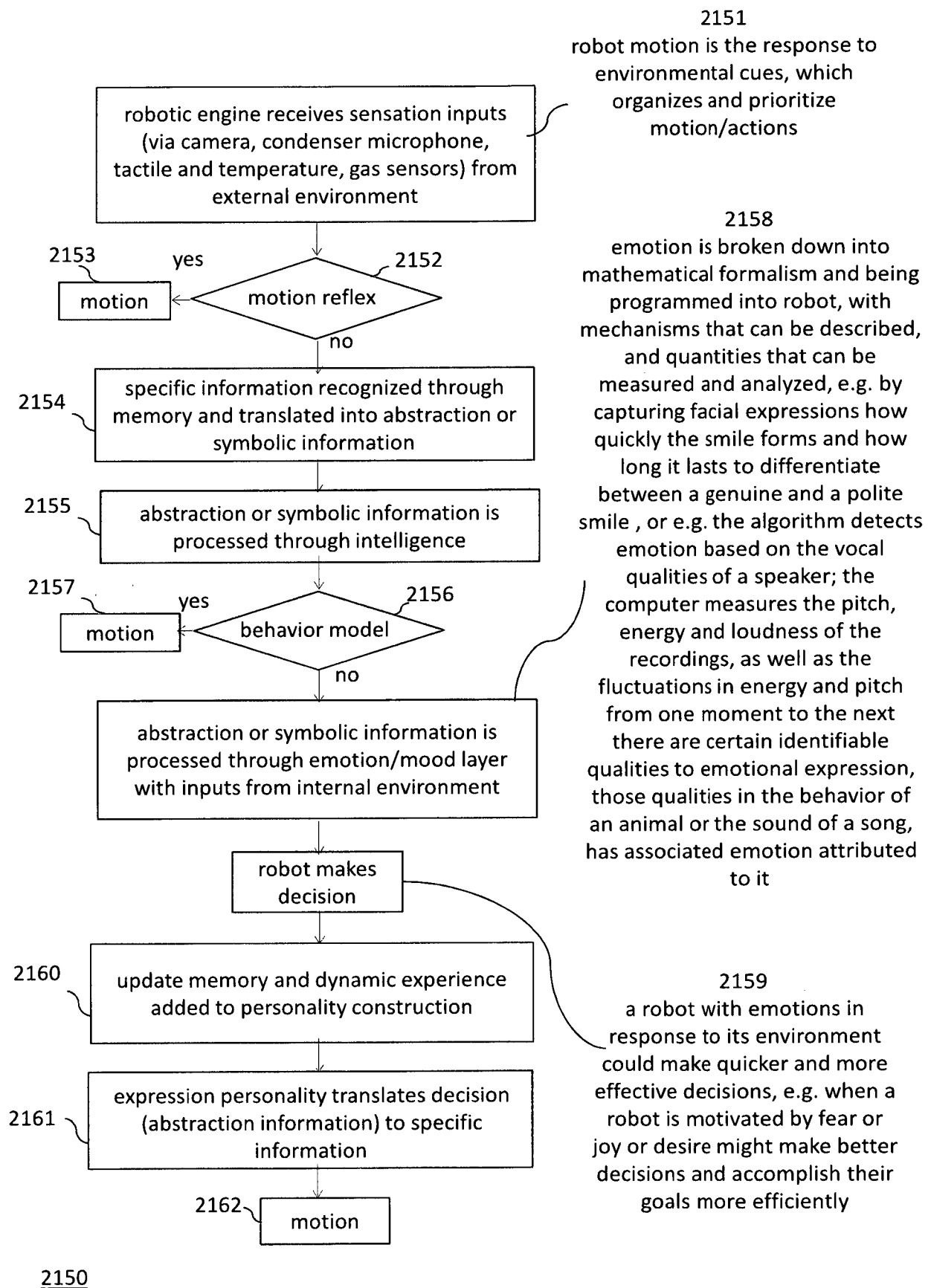


FIG. 90

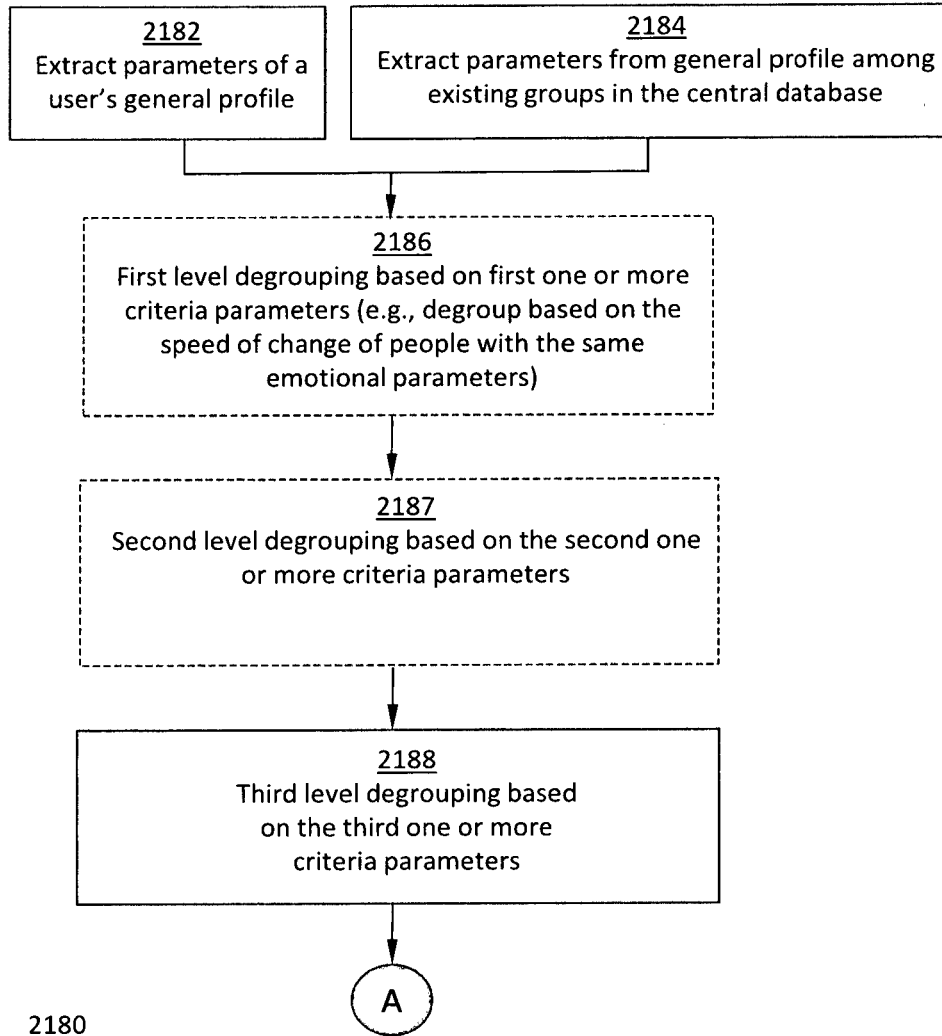


FIG. 91A

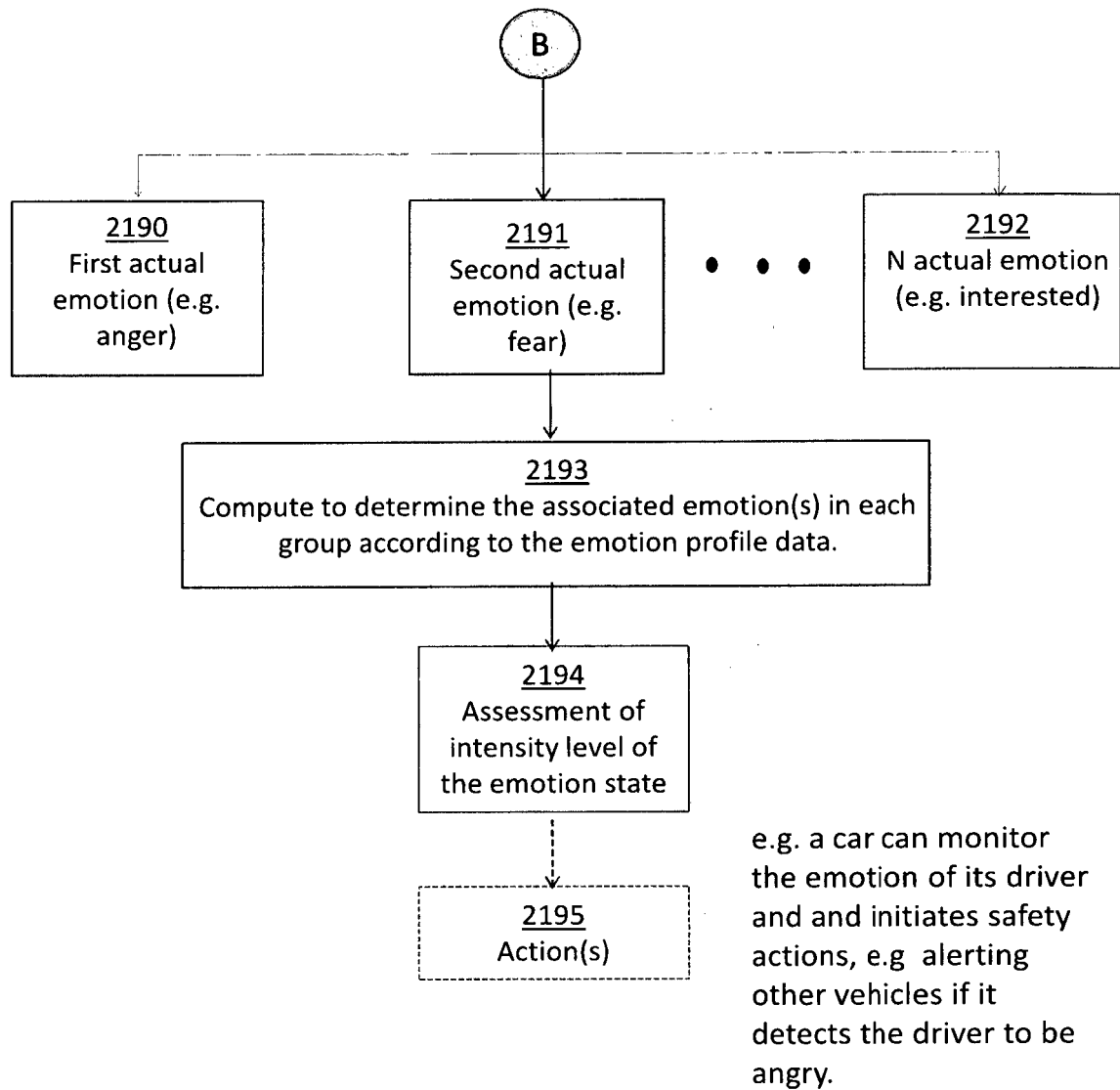


FIG. 91B

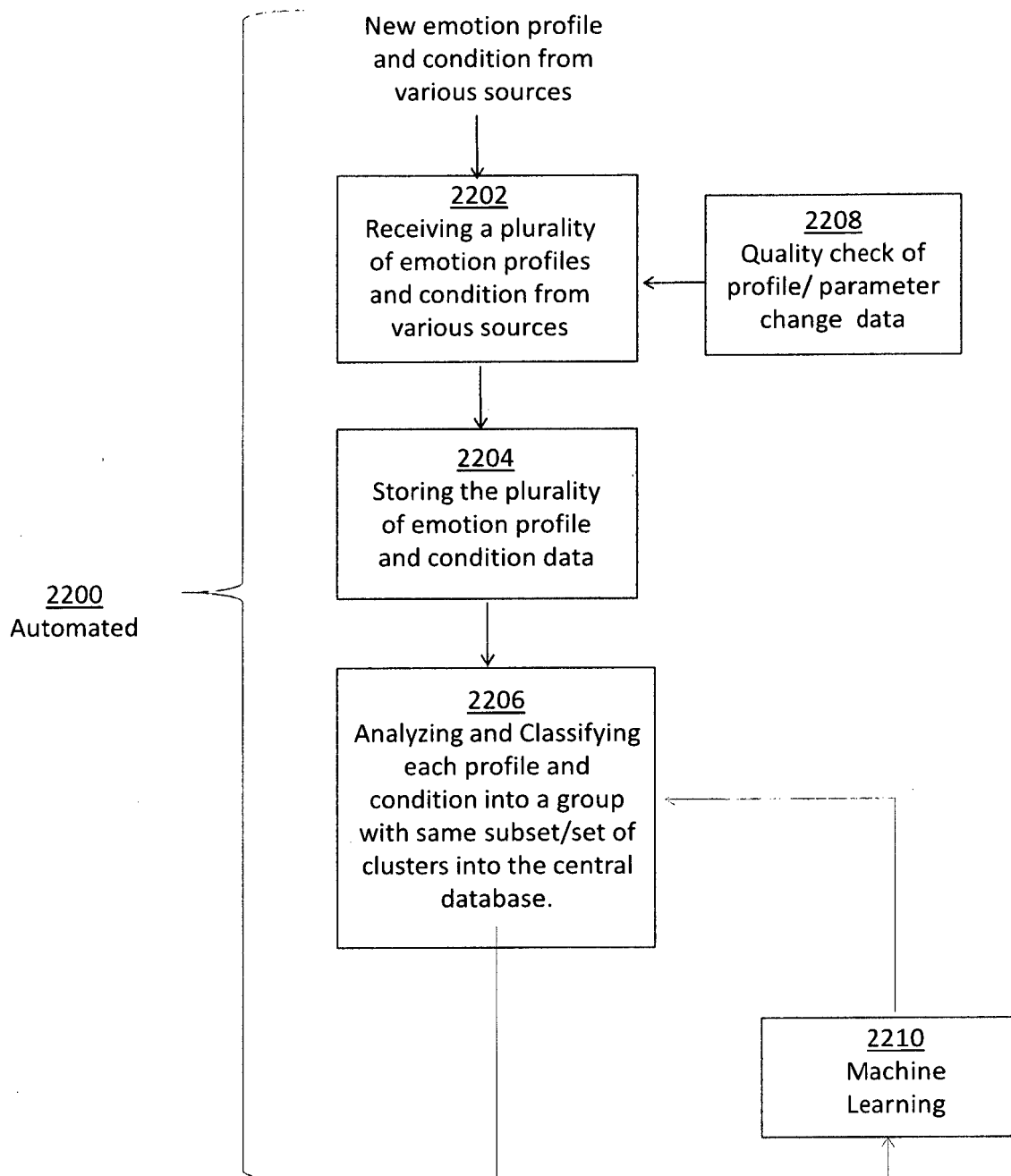


FIG. 91C

2220

Emotion detection and analysis

A person's emotional state can be detected by monitoring and analyzing the person's physiological signs, under a defined condition with internal and/or external stimulus, how these physiological signs change over a certain timeline.. There are nine key physiological sign parameters to be measured in order to build a person's emotion profile

2221

Sets of hormones, which are secreted internally and trigger various biochemical pathways that cause certain effects. e.g. Adrenalin and insulin are hormones

2223

micro expression, which is a brief, involuntary facial expression shown on the face of humans according to emotions experienced.

2225

sweat (and goose bumps) e.g. a person's heart rate increases, face blushes and palms get sweaty in the state of being excited or nervous.

2222

Sets of pheromones, which are secreted externally, and have an effect on another creature in similar ways. e.g. androstenol, androstenone and androstadienone

2224

heart rate (and blood vessel)

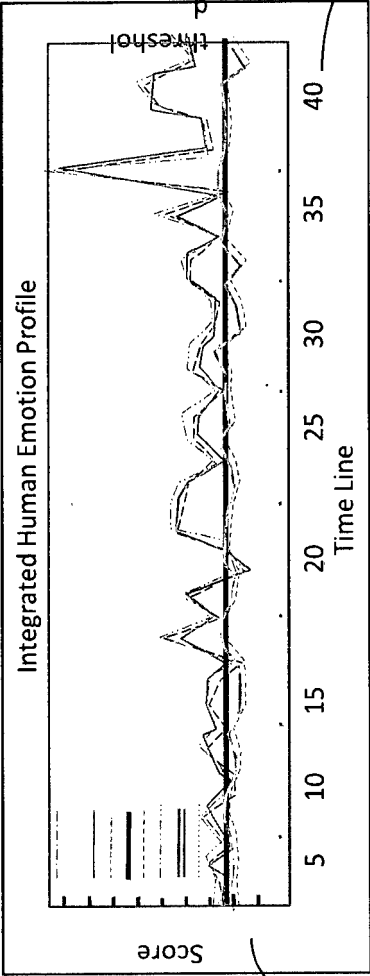
2226

pupil dilator (and iris sphincter, biliary muscle), e.g. pupil dilation for a short time in response to feelings of fear.

2229

reflex movement, which is the movement/action primarily controlled by the spinal arc, as a response to an external stimulus, e.g. jaw jerk reflex

time line 1			time line 40		
sets of emotion parameters			sets of emotion parameters		
1	sets of hormone	Score 10	1	sets of hormone	Score 3.6
2	sets of pheromones	9.5	2	sets of pheromones	2.5
3	microexpression	7	3	microexpression	1.9
4	heart rate	8	4	heart rate	3.8
5	sweat	8	5	sweat	3.5
6	pupil dilator	4.3	6	pupil dilator	2
7	reflex movement	3.6	7	reflex movement	7
8	body temperature	2.5	8	body temperature	5.5
9	pressure	6.2	9	pressure	3.8



2230

The analysis of parameter changes over a certain time line establish a person's integrated emotion profile.

2231

Time Line

(e.g. by hours, days, weeks...)

FIG. 92A

2240

Integrated human emotion profile system to capture and learn emotional cycle

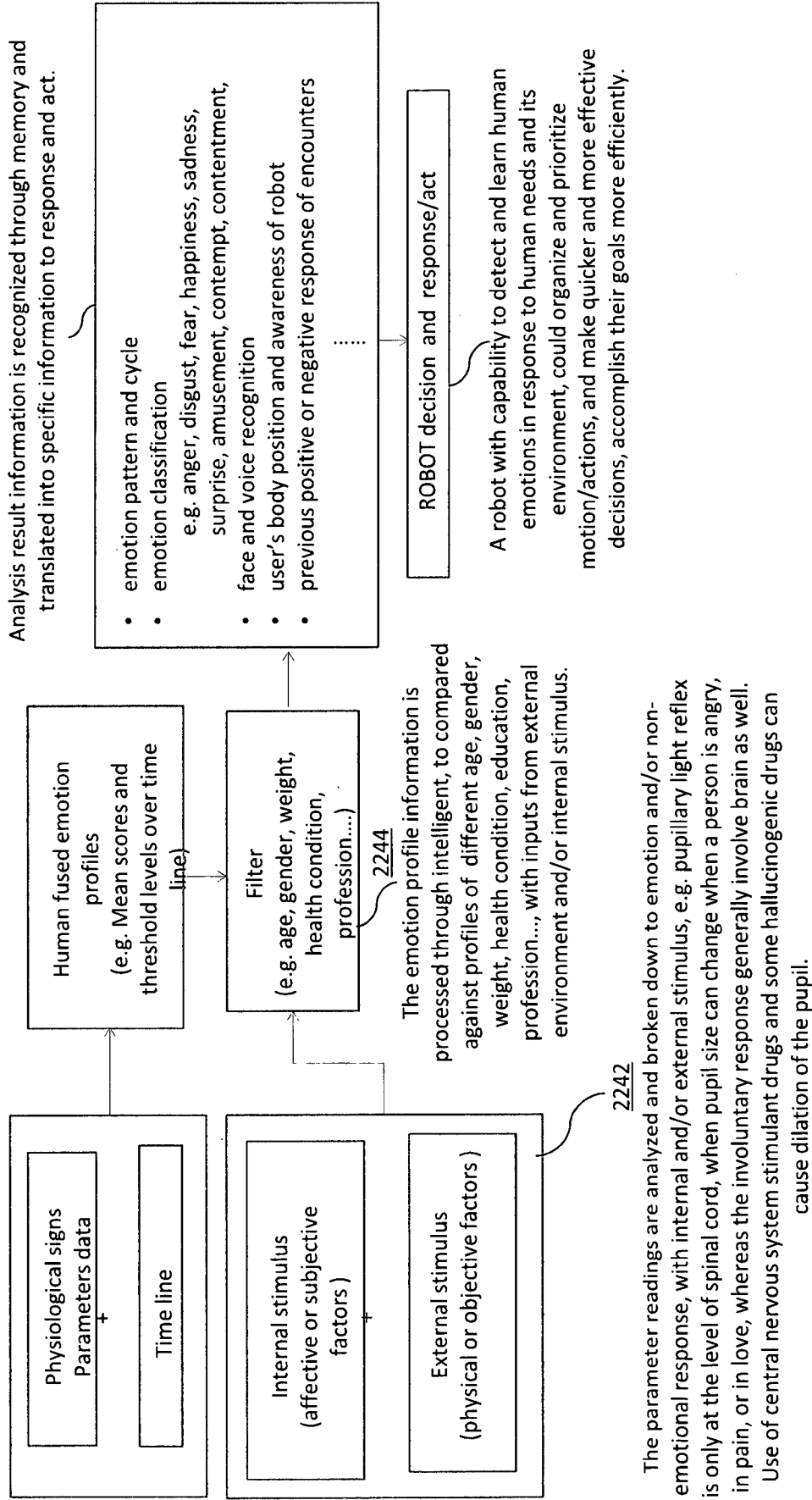


FIG. 92B

When measuring the physiological signs change, the monitoring can also be managed manually as well, e.g. a user can touch a button with a first tag on the time in which the change of emotion has started and touch the button again with a second tag when the emotion change has concluded. Also user should describe the emotion he feels. Using this process computer can learn how all emotion parameters change when user feels definite emotion. With data/information collected from mass amount of users computer classifies all changes associated with each emotion and mathematically finds the significant and specific parameters changes, which are connected with this particular emotion.

Whenever uses experiences emotional or mood swing – with a port connecting to his body, above the skin and directly to the vein, physiological parameters such as hormone, heart rate, sweat, pheromones can be detected and recorded. The start and end of the mood change can be judged by the person himself as the emotion or state change starts or no longer exists. . e.g. a person initiated 4 manual emotion cycles and creates 4 timelines within a week, as determined by the person, the first one lasts 2.8 hour from he tags the start till he tags the end. The second cycle last for 2 hours, the third one last for 0.8 hours, the fourth one last for 1.6 hours

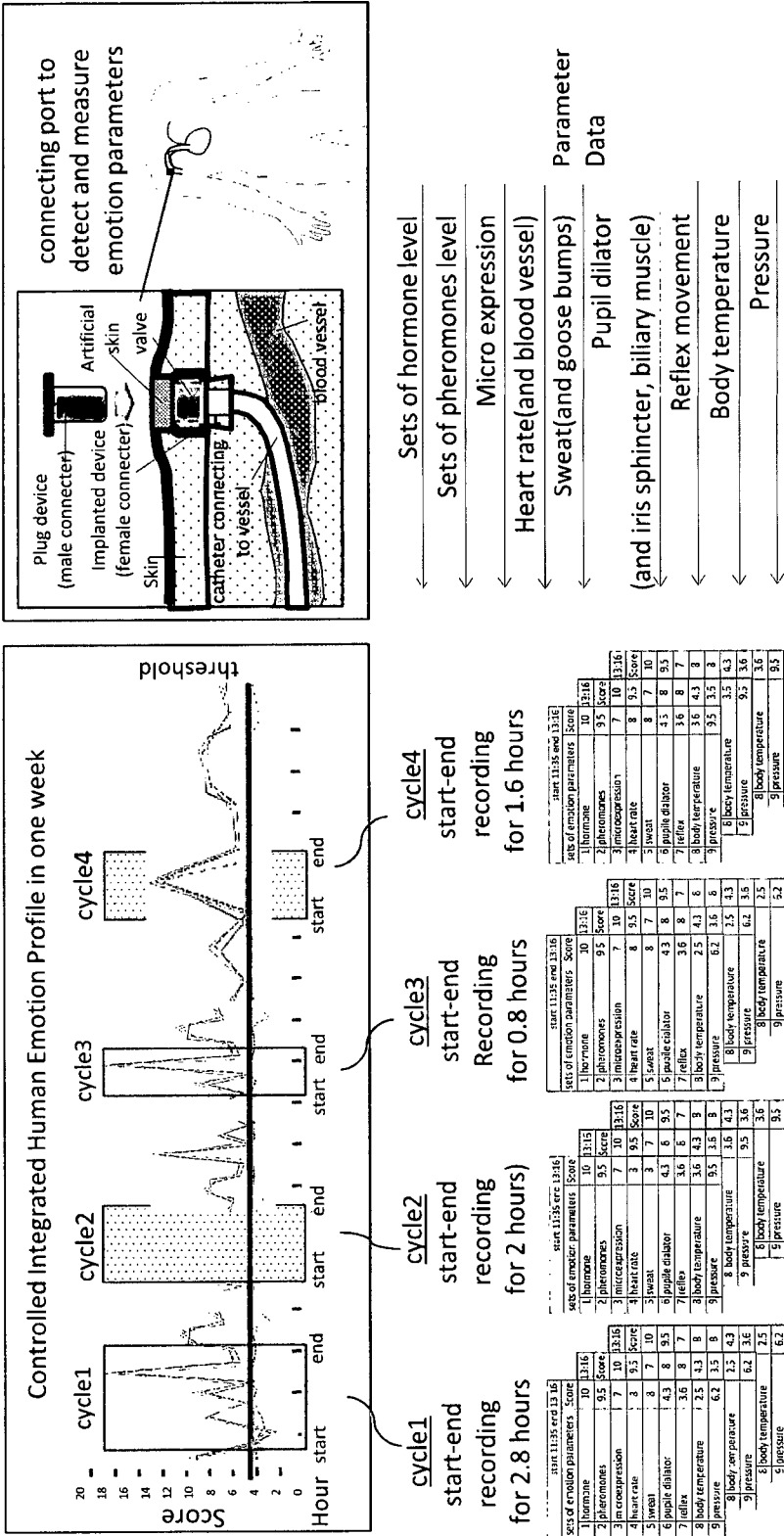


FIG. 93

personal emotion detection and recording using connecting port device

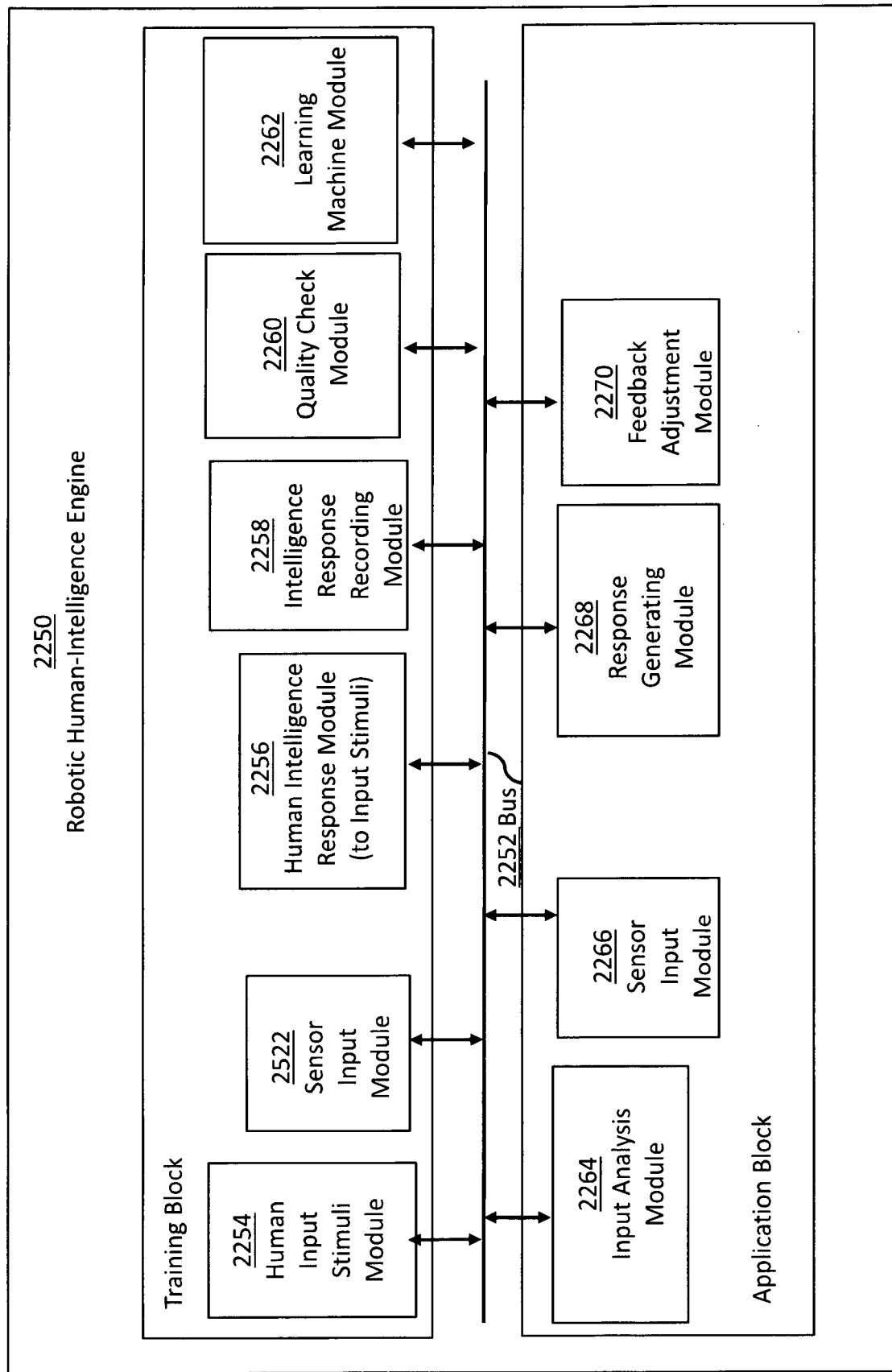


FIG. 94A

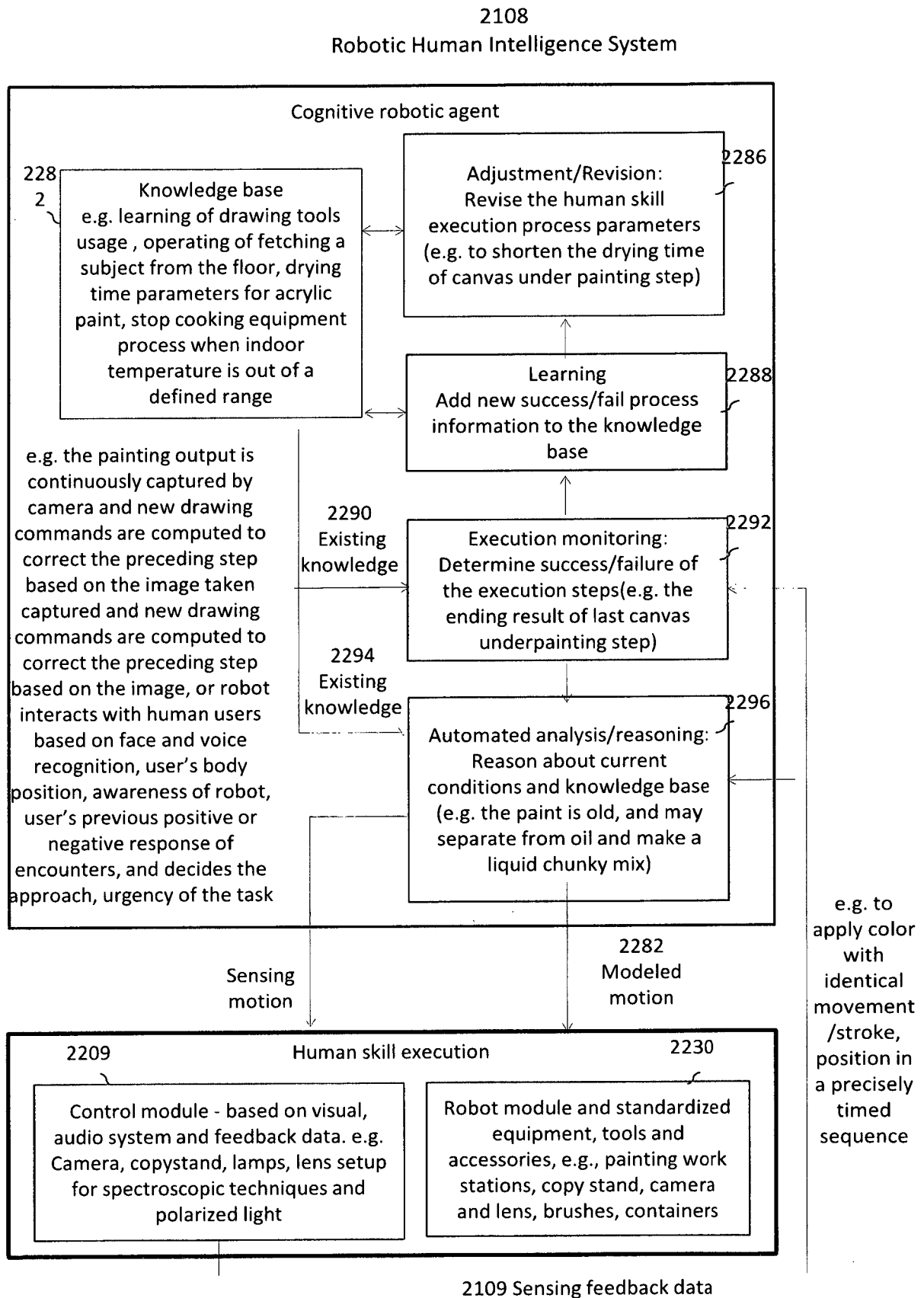


FIG. 94B
Robotic Intelligence System

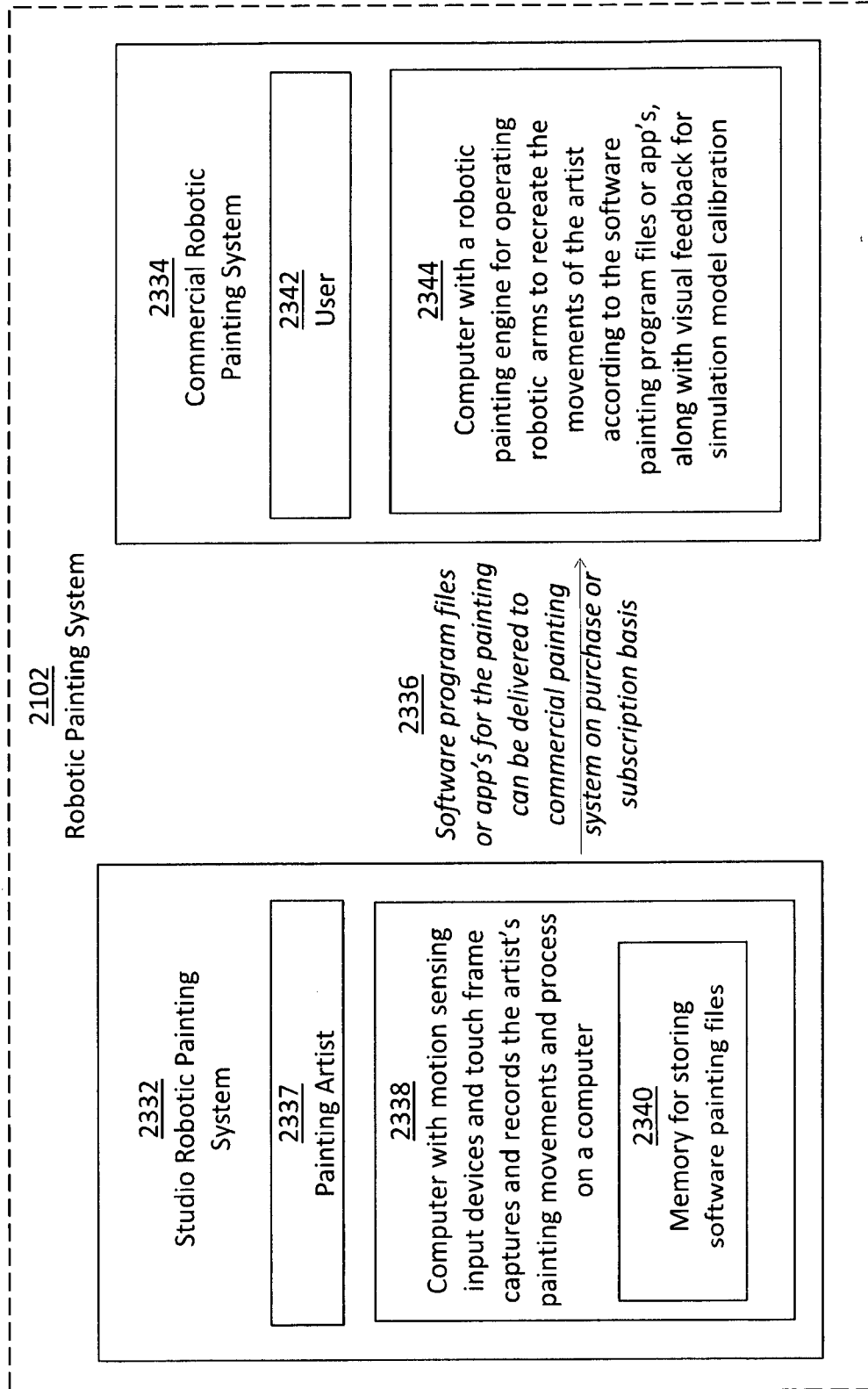


FIG. 95A

2350
Robotic Painting System

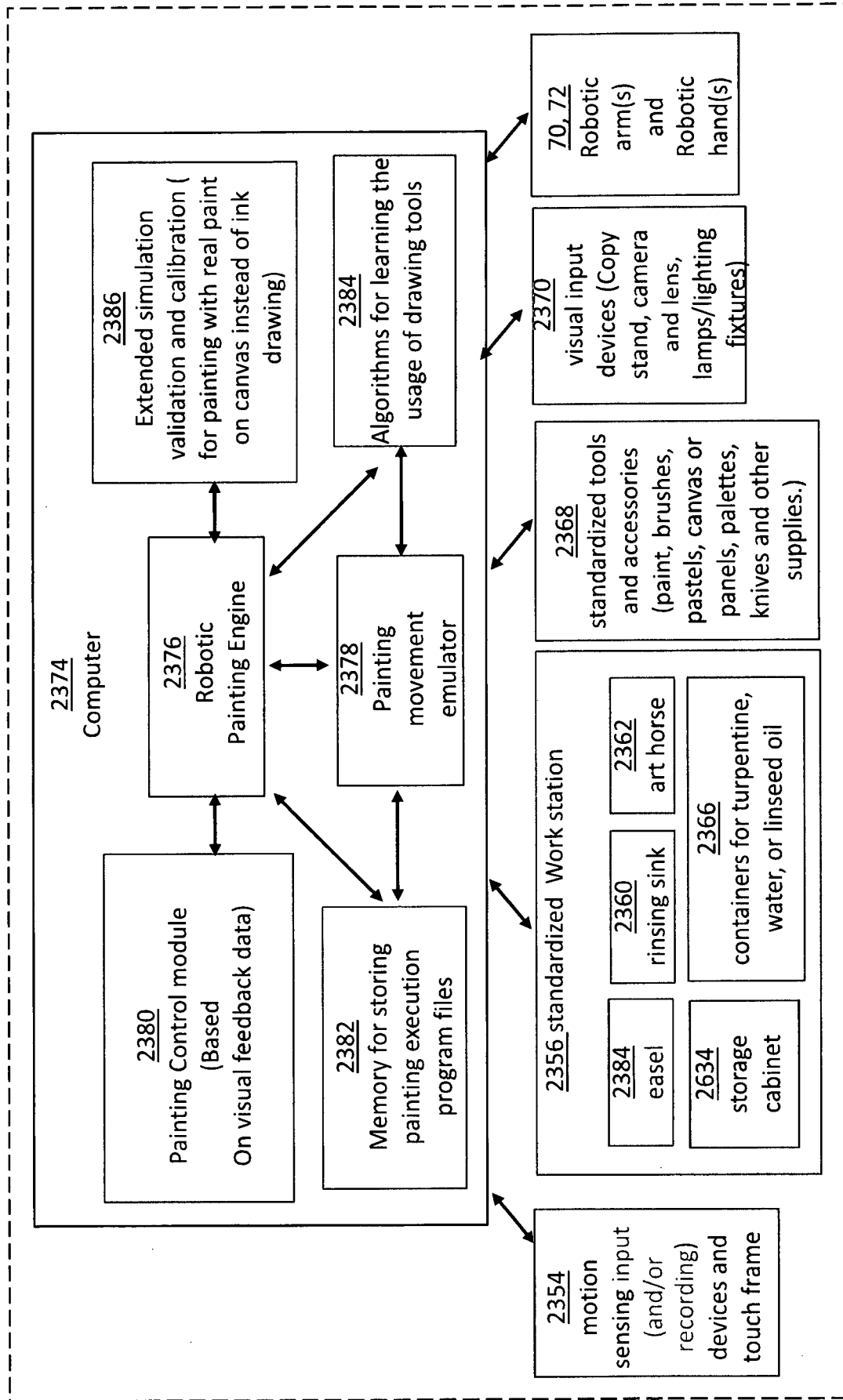


FIG. 95B

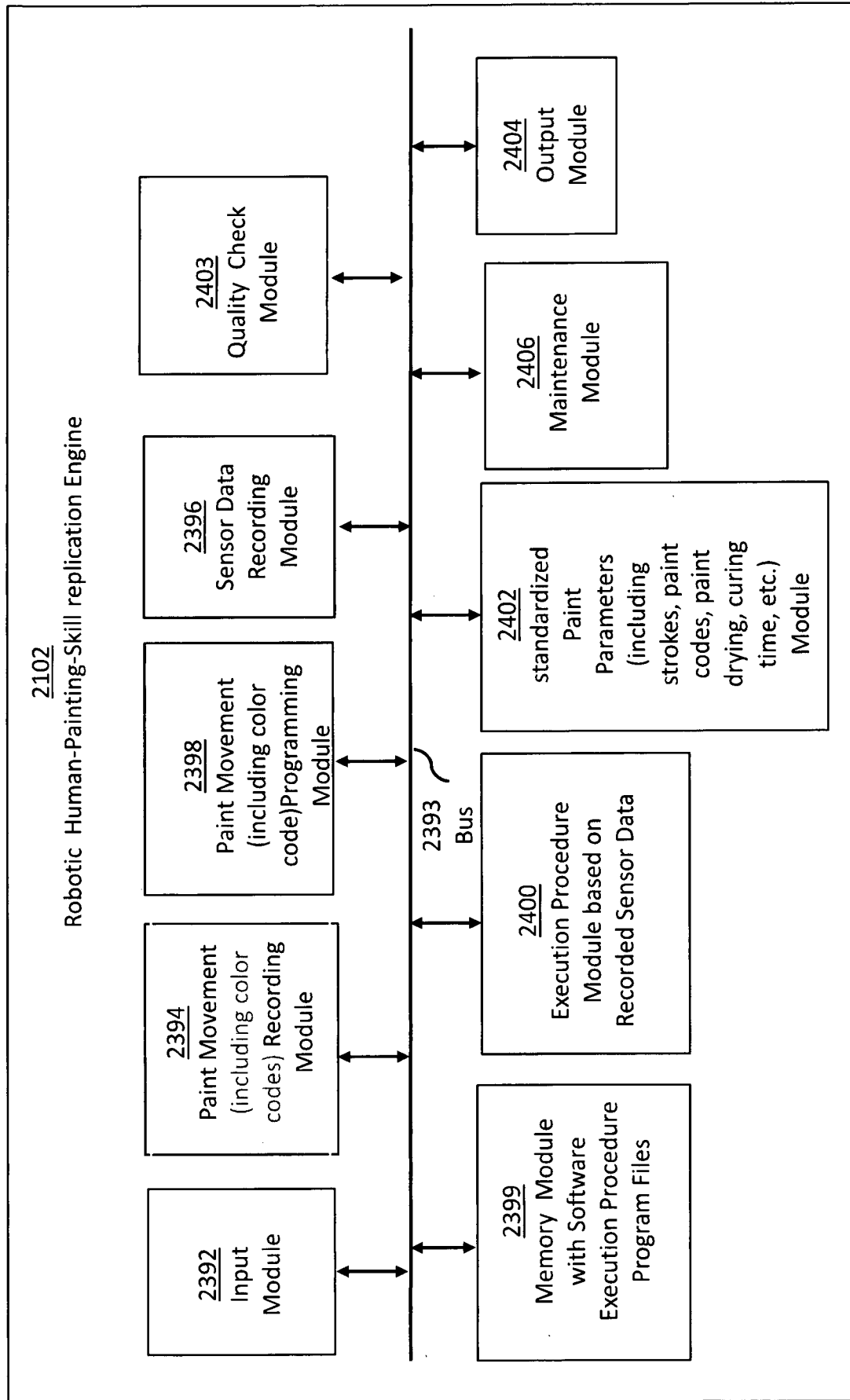


FIG. 95C

2410
Painting Painting Recording Process

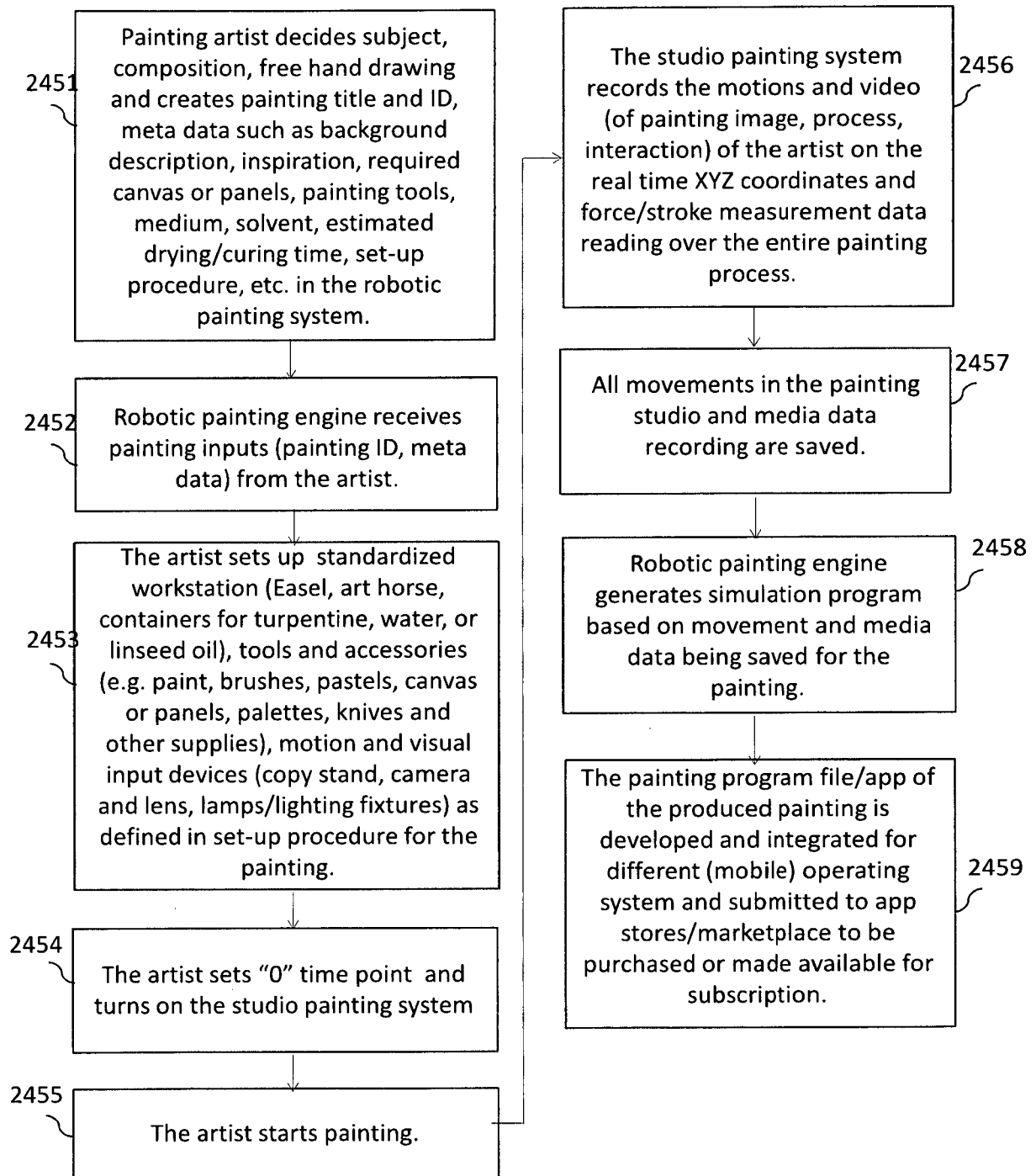


FIG. 96A

2460 Robotic Painting System

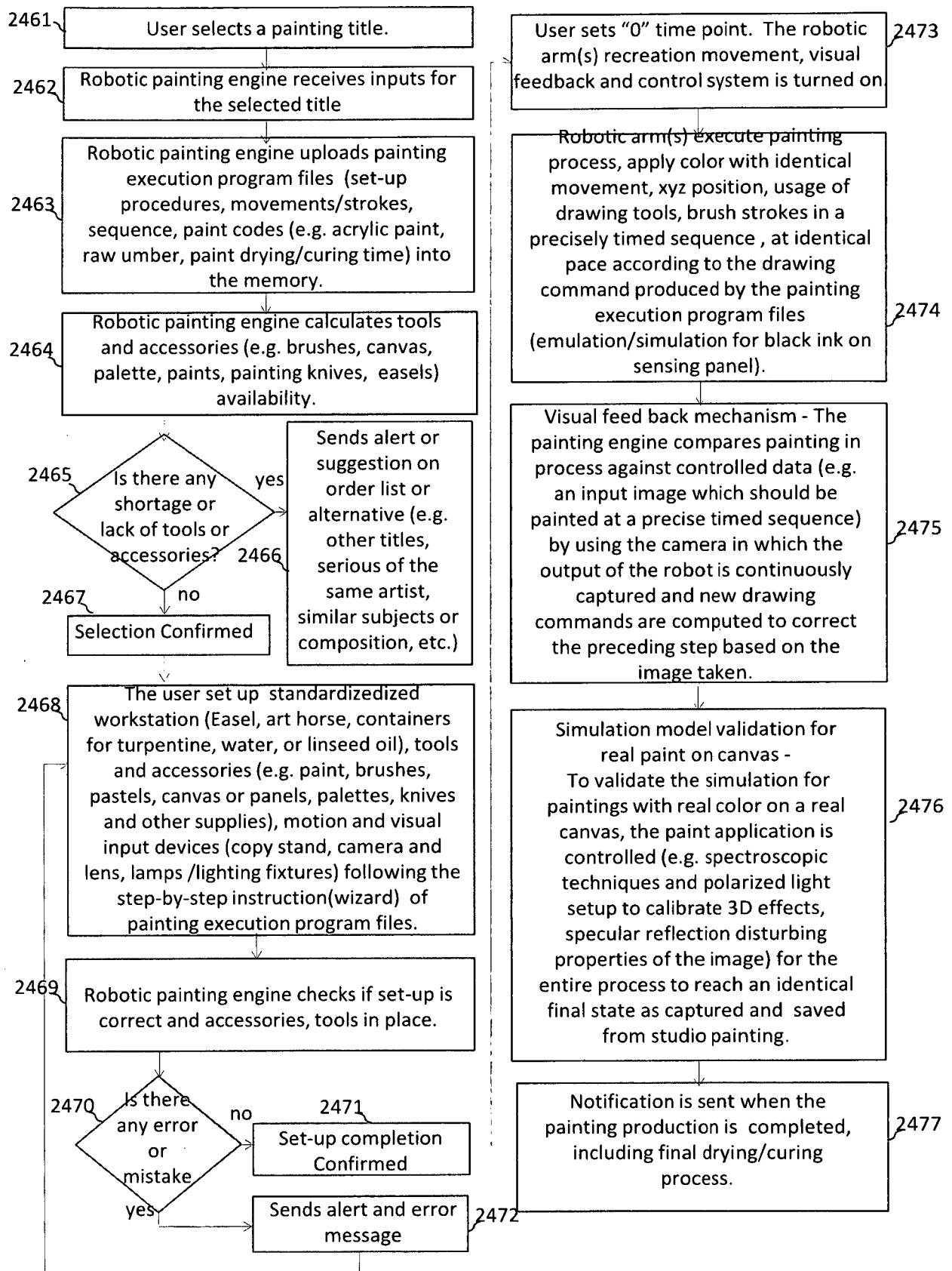


FIG. 96B

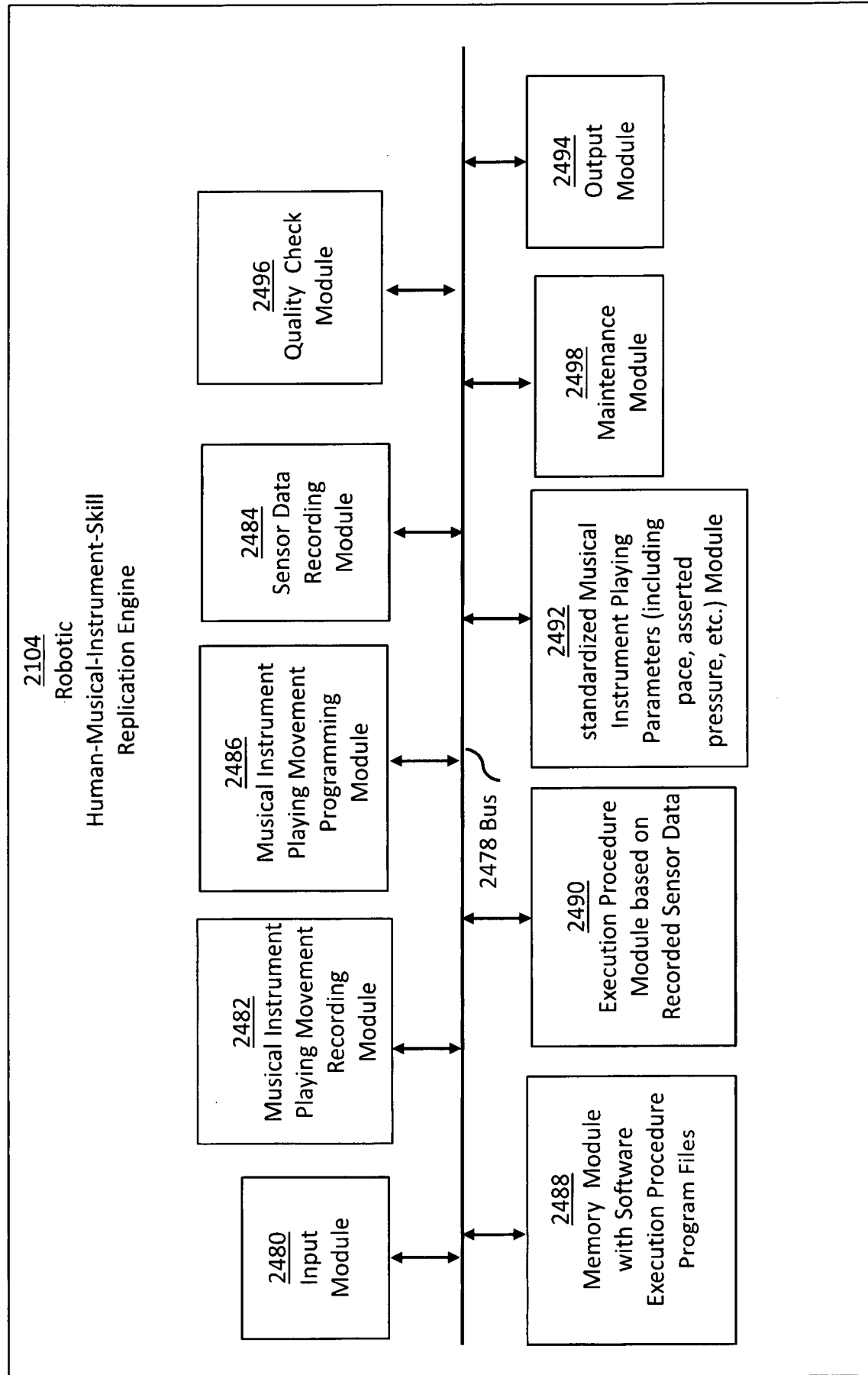


FIG. 97A

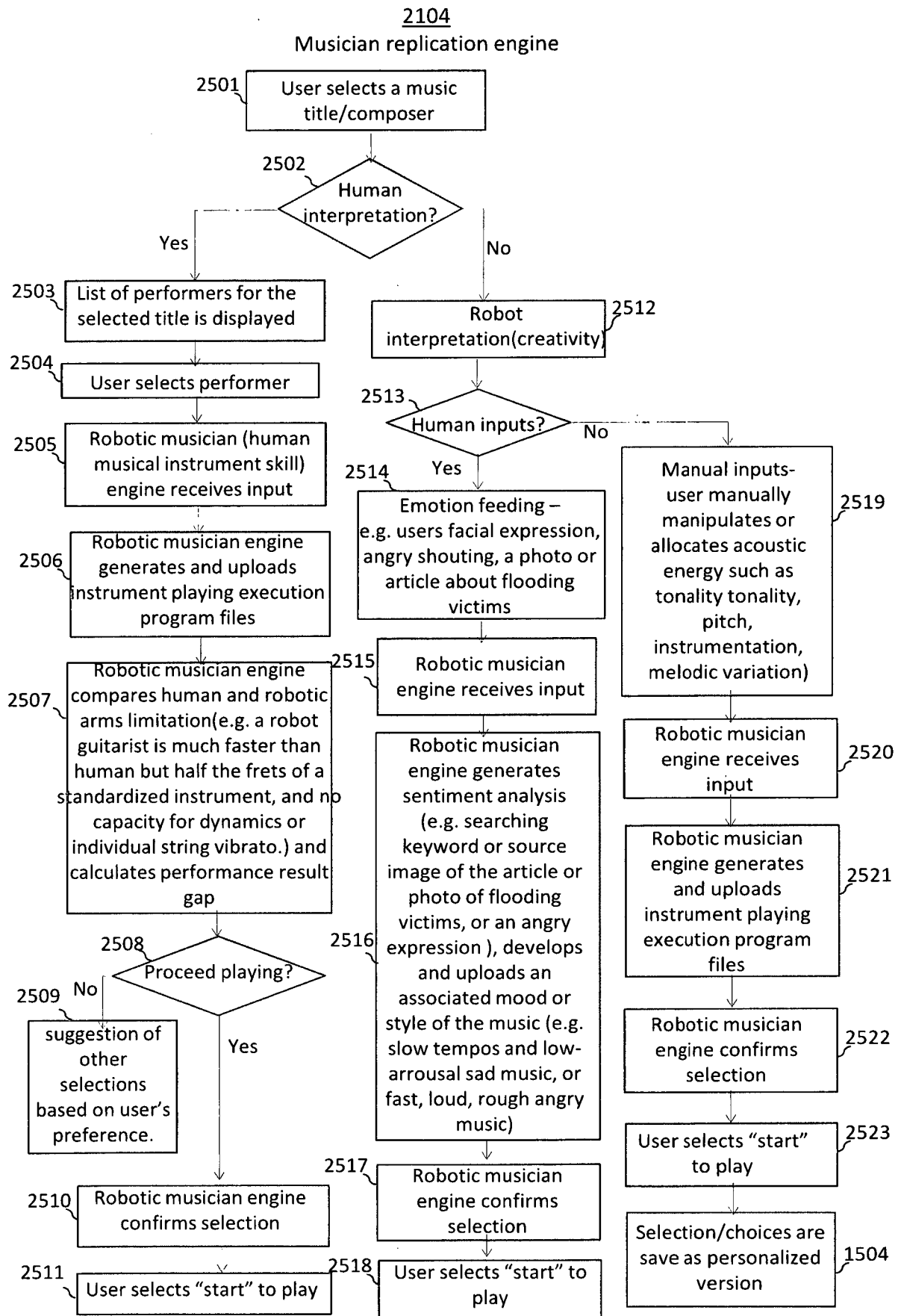


FIG. 97B

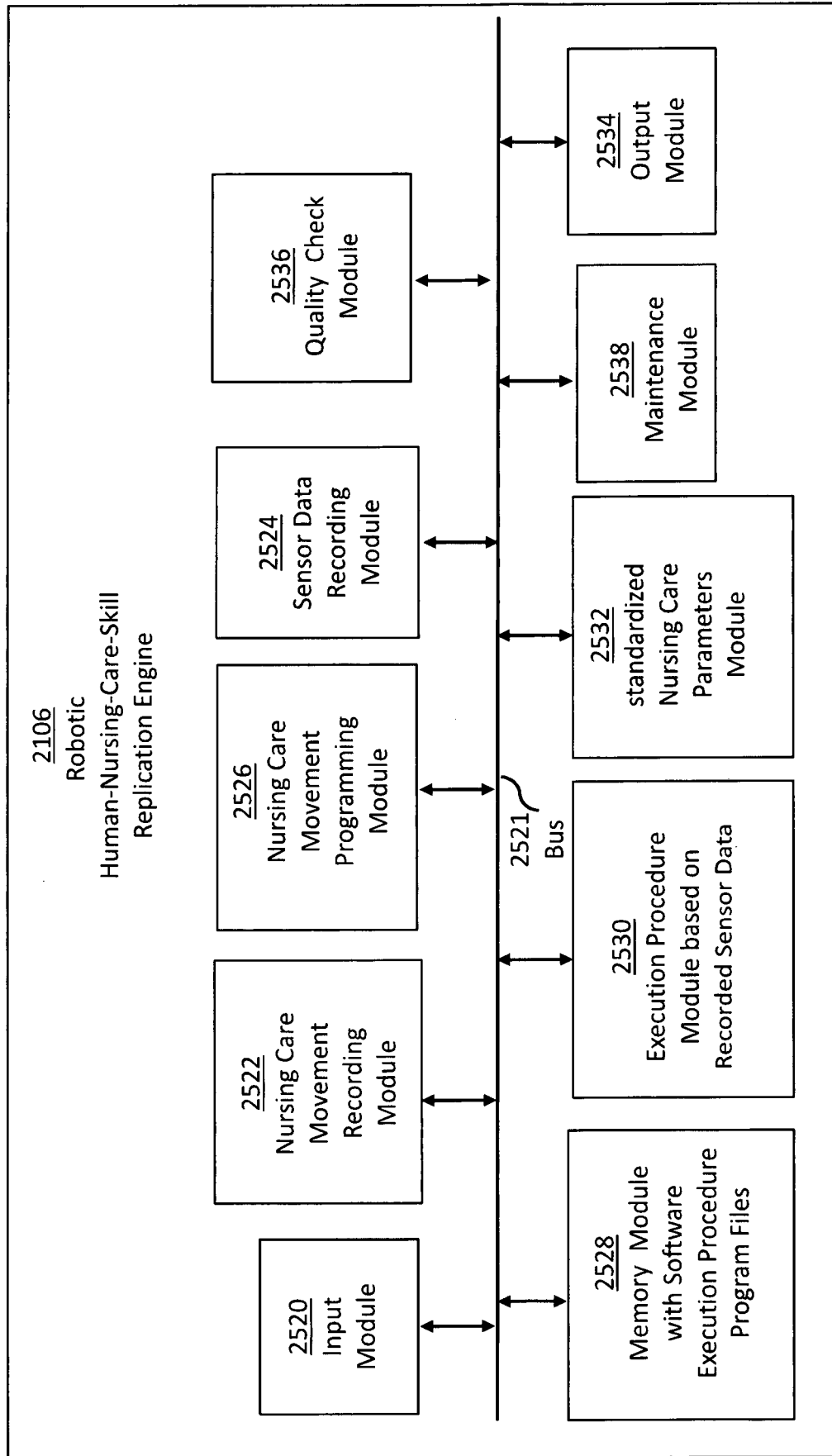


FIG. 98

2550

Robotic Human Nursing Care System Process

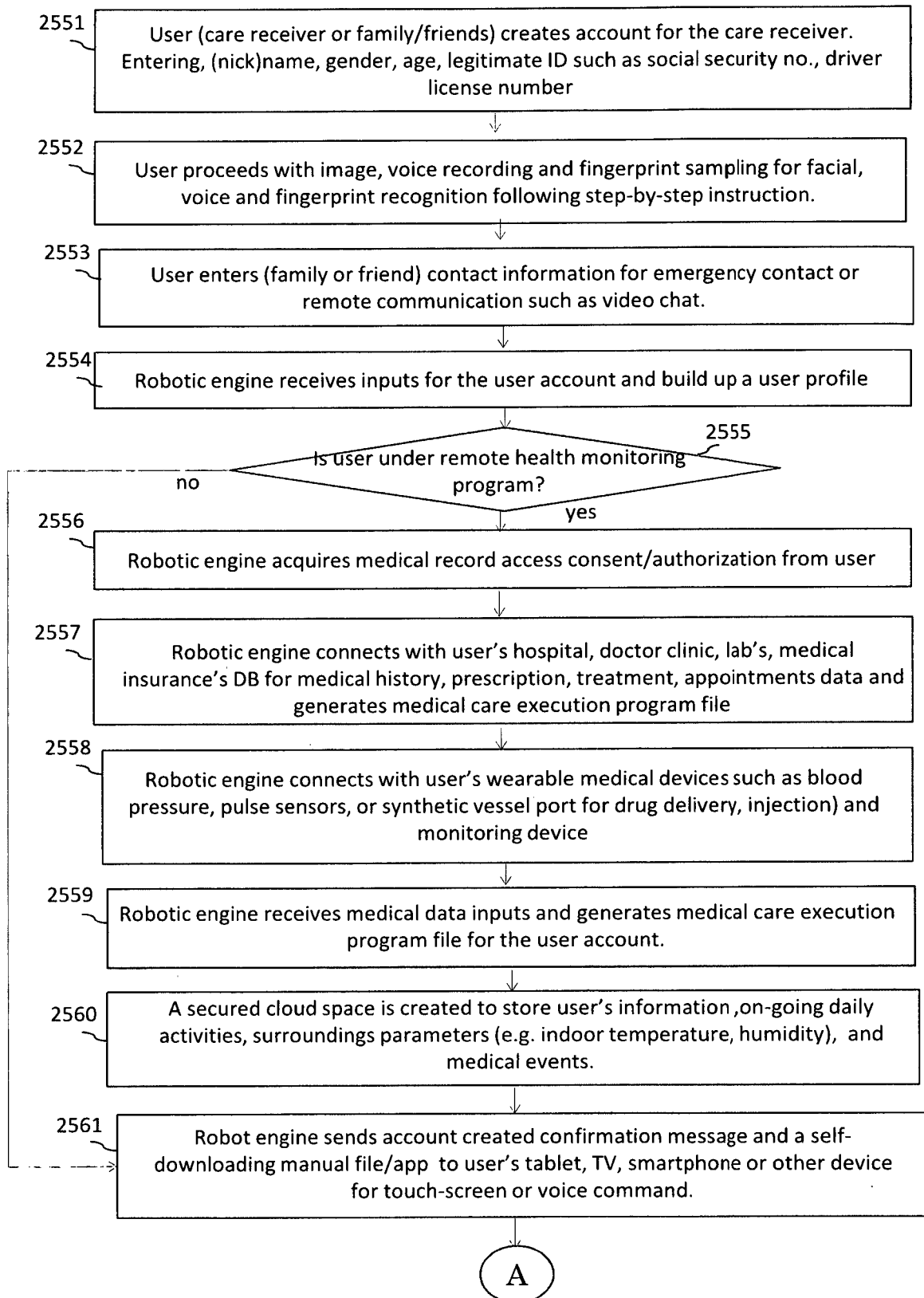


FIG. 99A

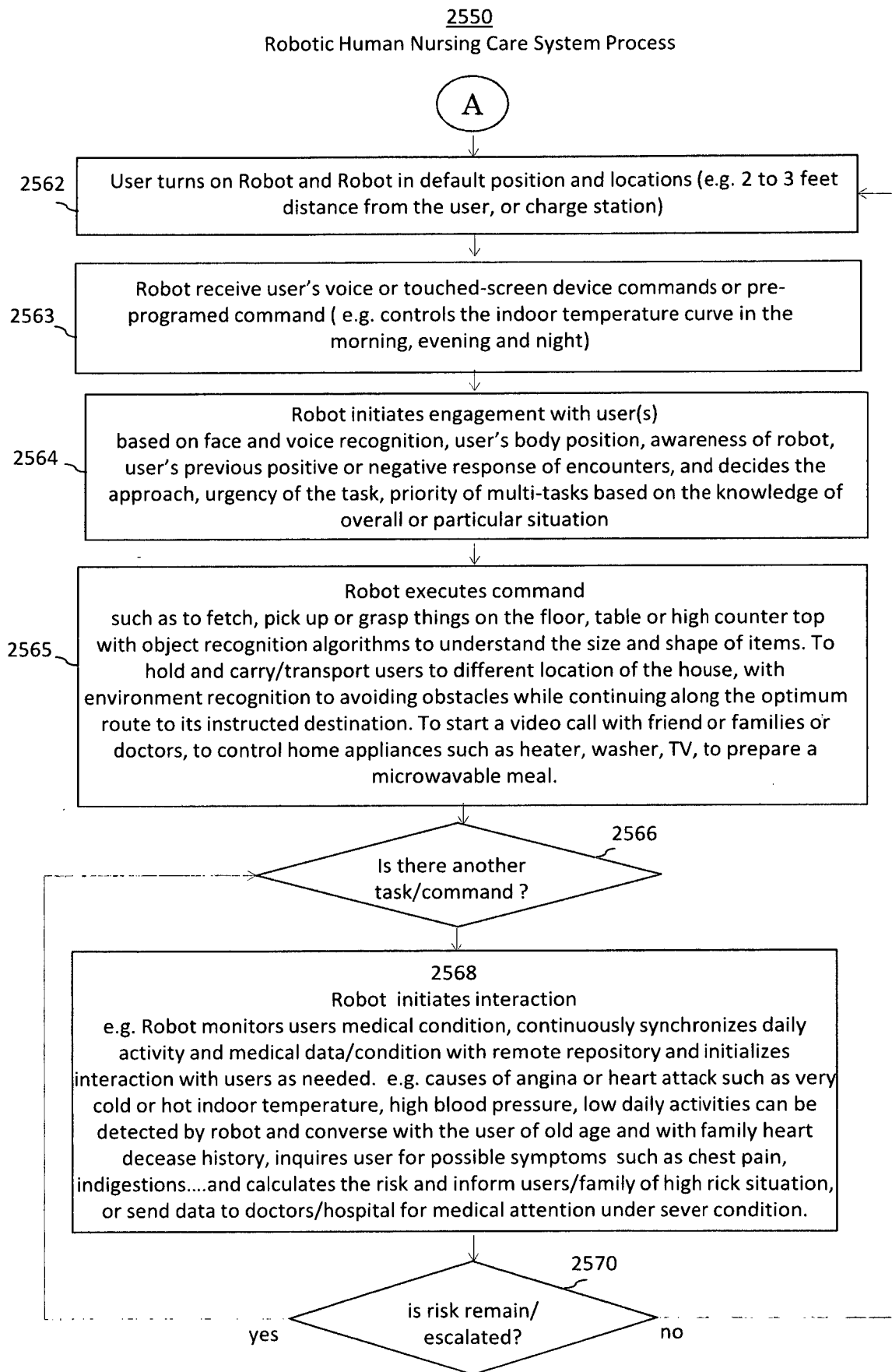


FIG. 99B
Robotic Human Nursing Care System Process

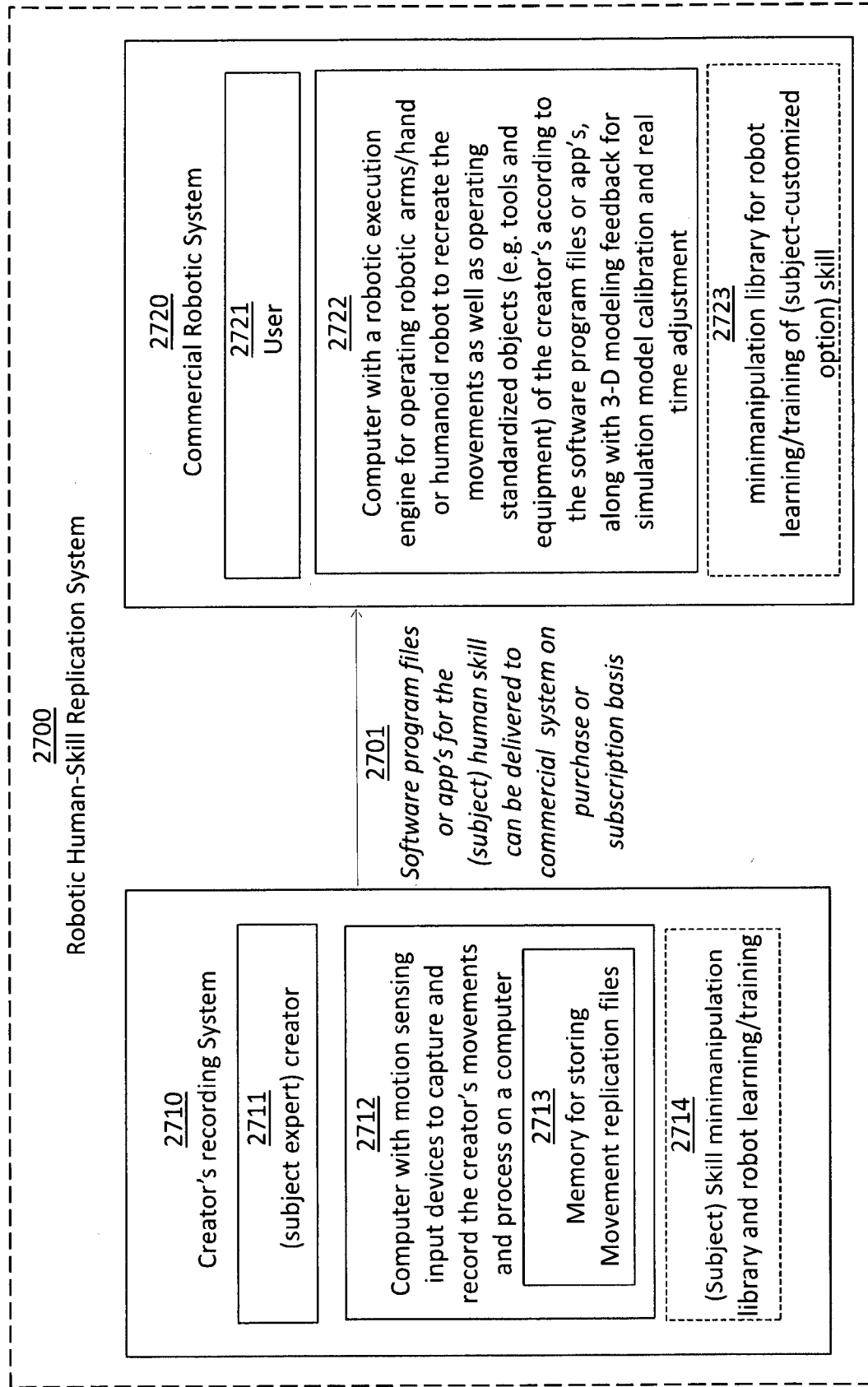


FIG. 100

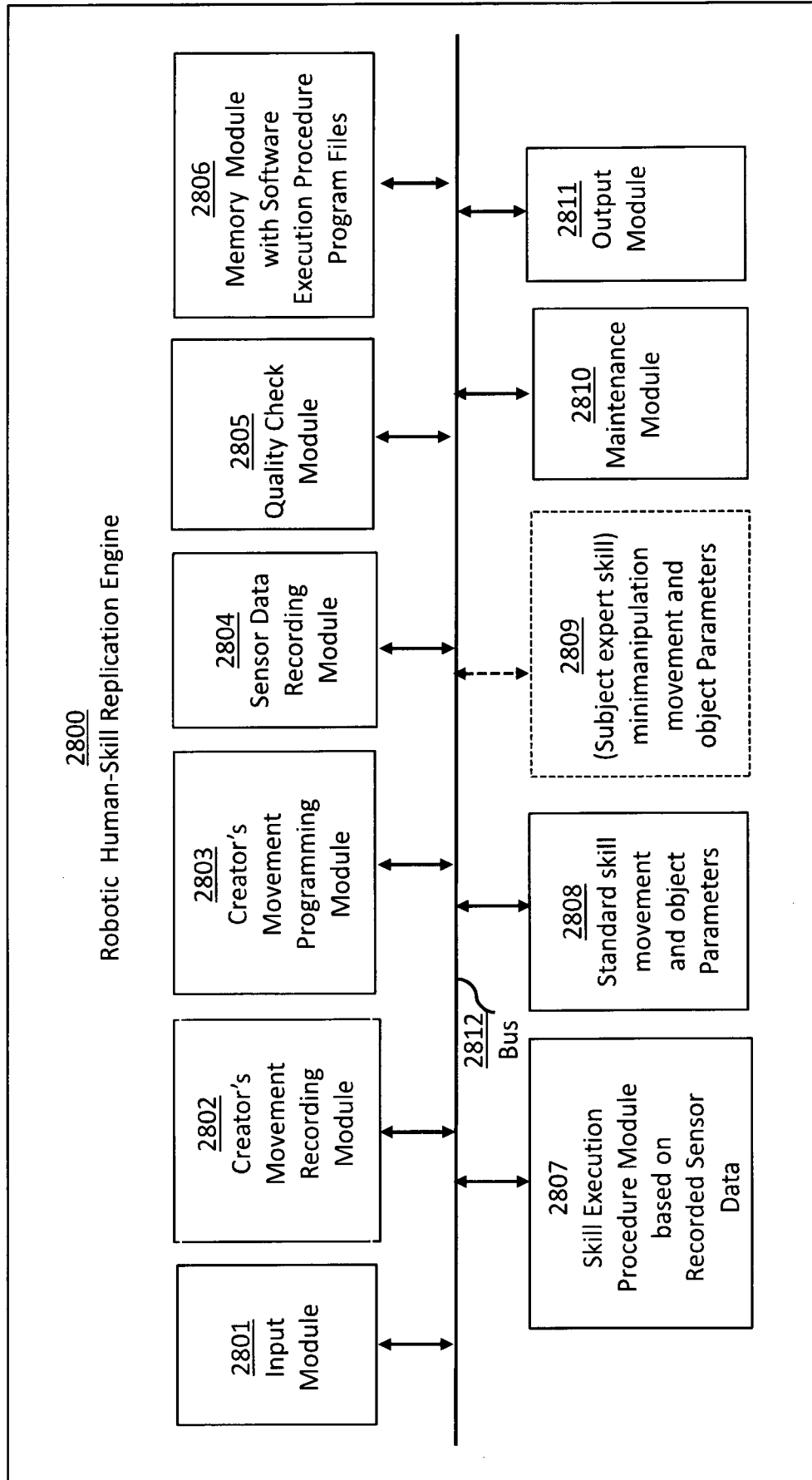


FIG. 101

2700
Robotic Human-Skill Replication System

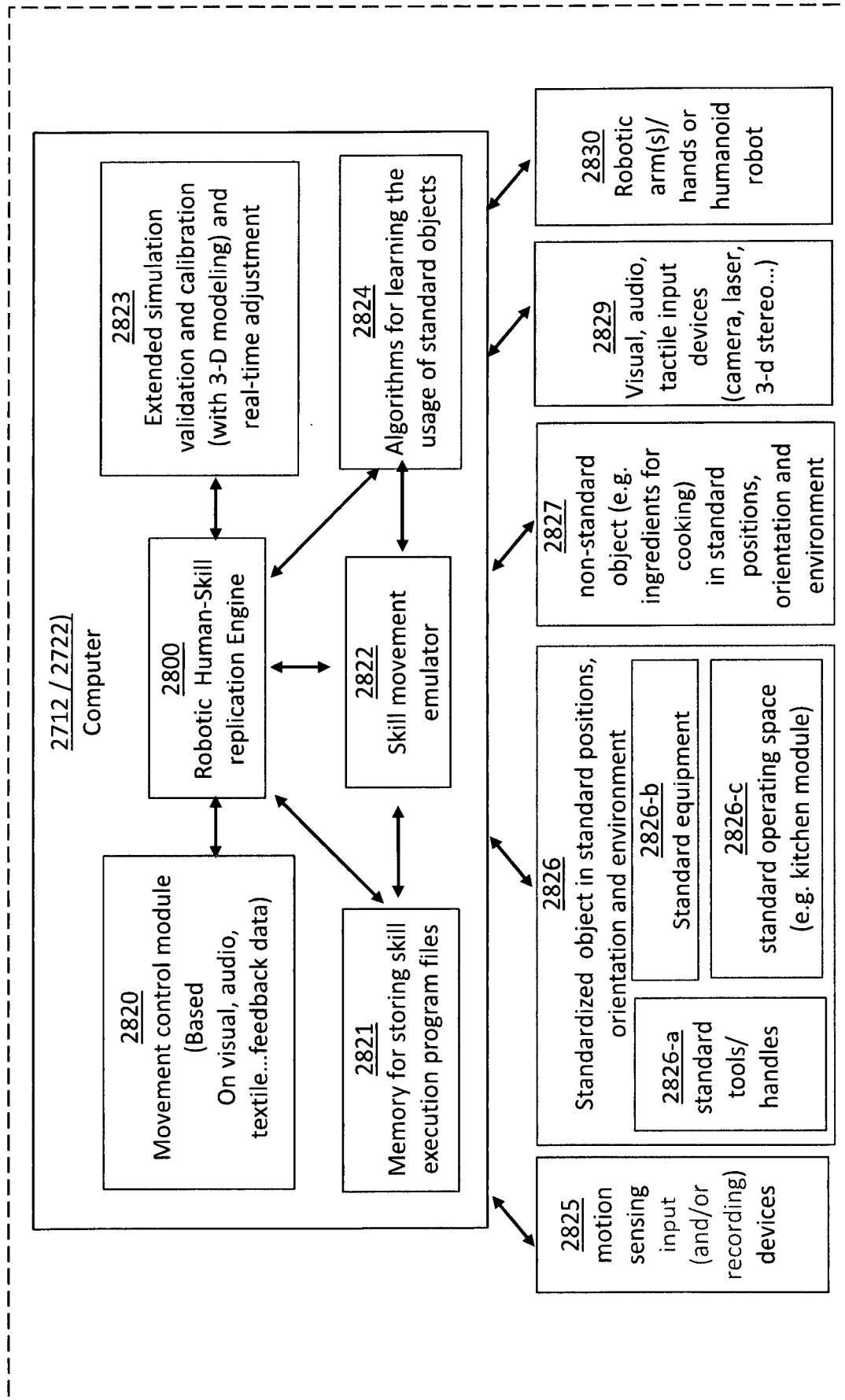


FIG. 102

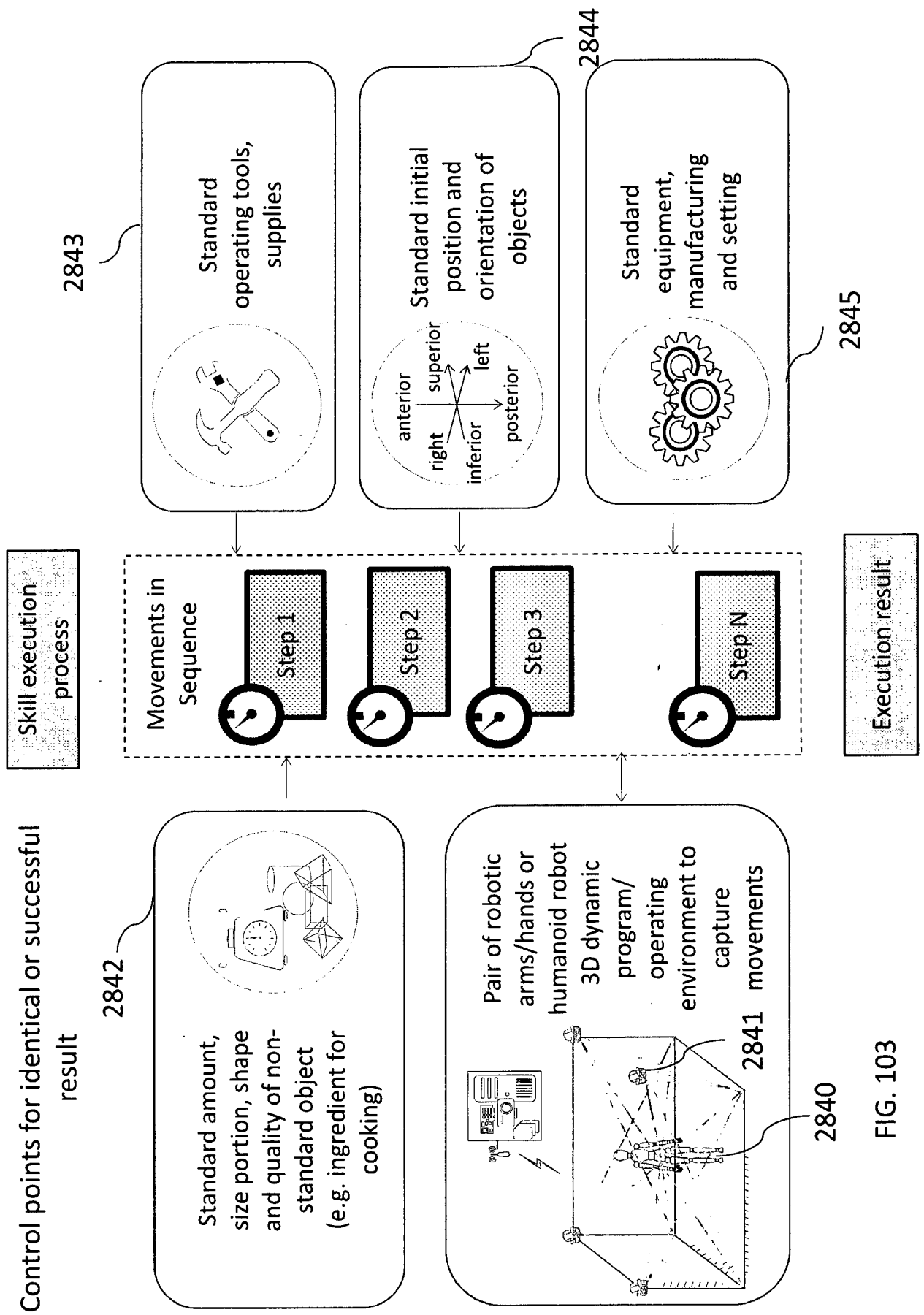


FIG. 103

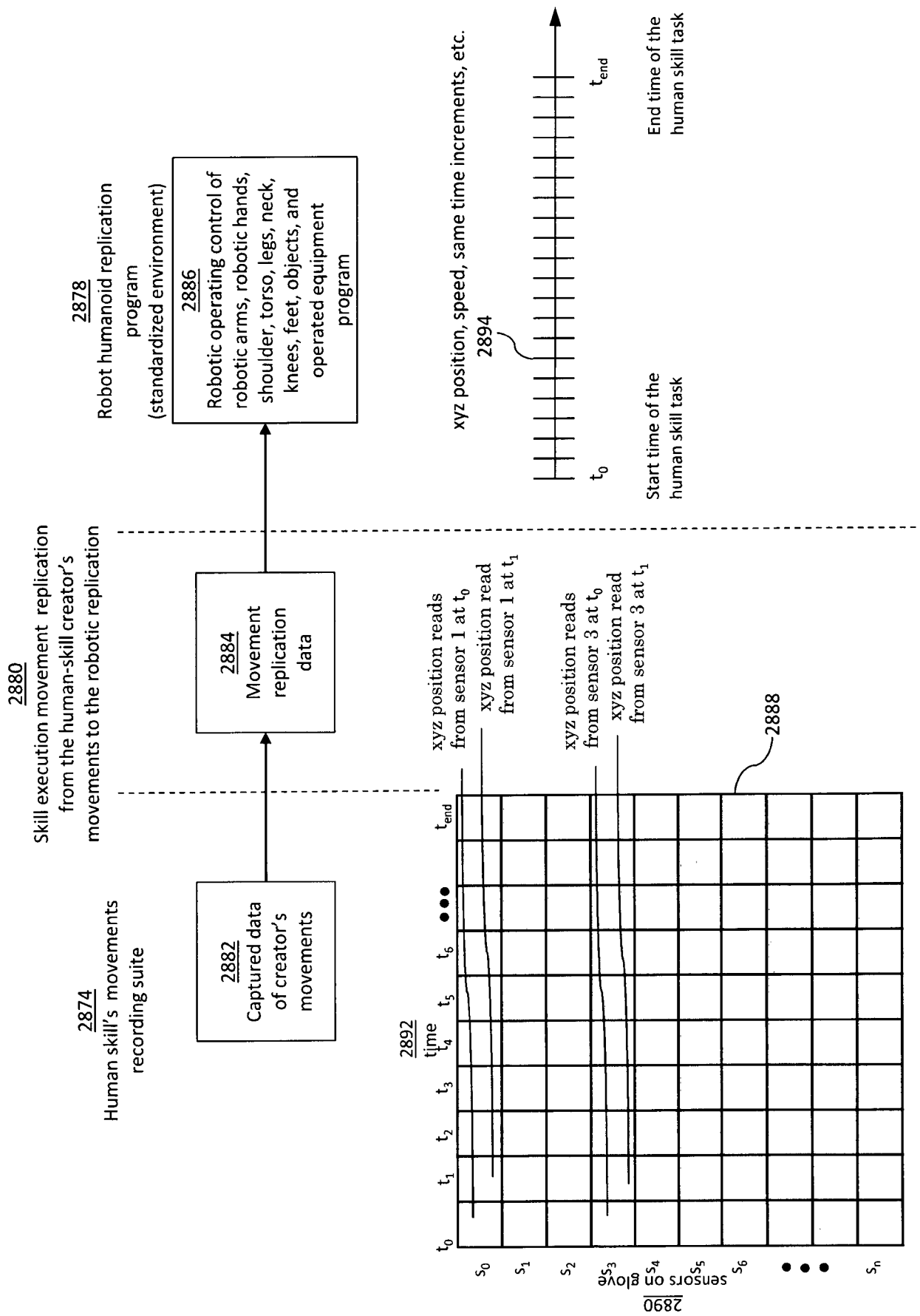
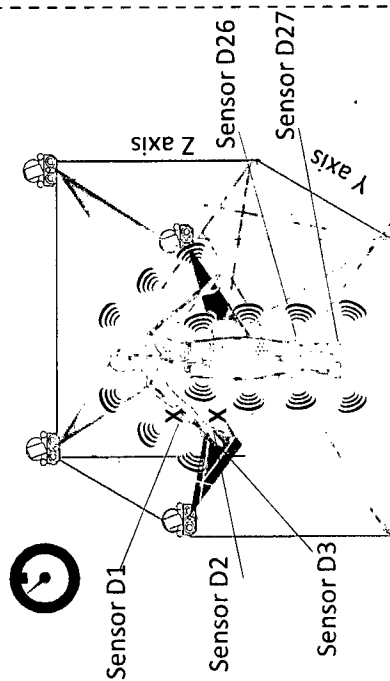


FIG. 104

3000 (subject expert) Creator movement

Recording Suite



3001
Sensor data reading over time
(in fixed time increments)

start finish

SEC	1	2	3	4	...	End
D1	XYZ	XYZ	XYZ	XYZ	...	
D2		XYZ				
D3			XYZ			
:						
M1						
:						

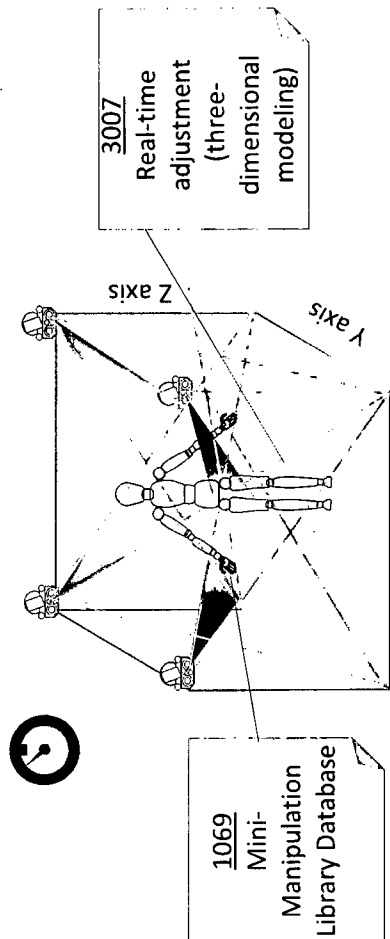
3002

(X,Y,Z) or minimanipulation: e.g. (M1.1) 1st parameter (M1.2) 2nd parameter, (M1.2) 3rd parameter...

106
Skill execution
Movement
replication



3003 Robotic Human-Skill Execution



3004

Robotic software instructions (e.g., control signals C₁, C₂...) for robotic arms/ hands (and feet, legs, shoulder, neck, torso...)

start finish

SEC	1	2	3	4	...	End
D1	<C1>					
D2		<C2>				
D3			<C3>			
:						
M1						
:						

3006

Control signals for the minimanipulation

Operate on the same XYZ coordinates

3008

Size, shape of non-standard object (three-dimensional temporary model of the non-standard object)

FIG. 105

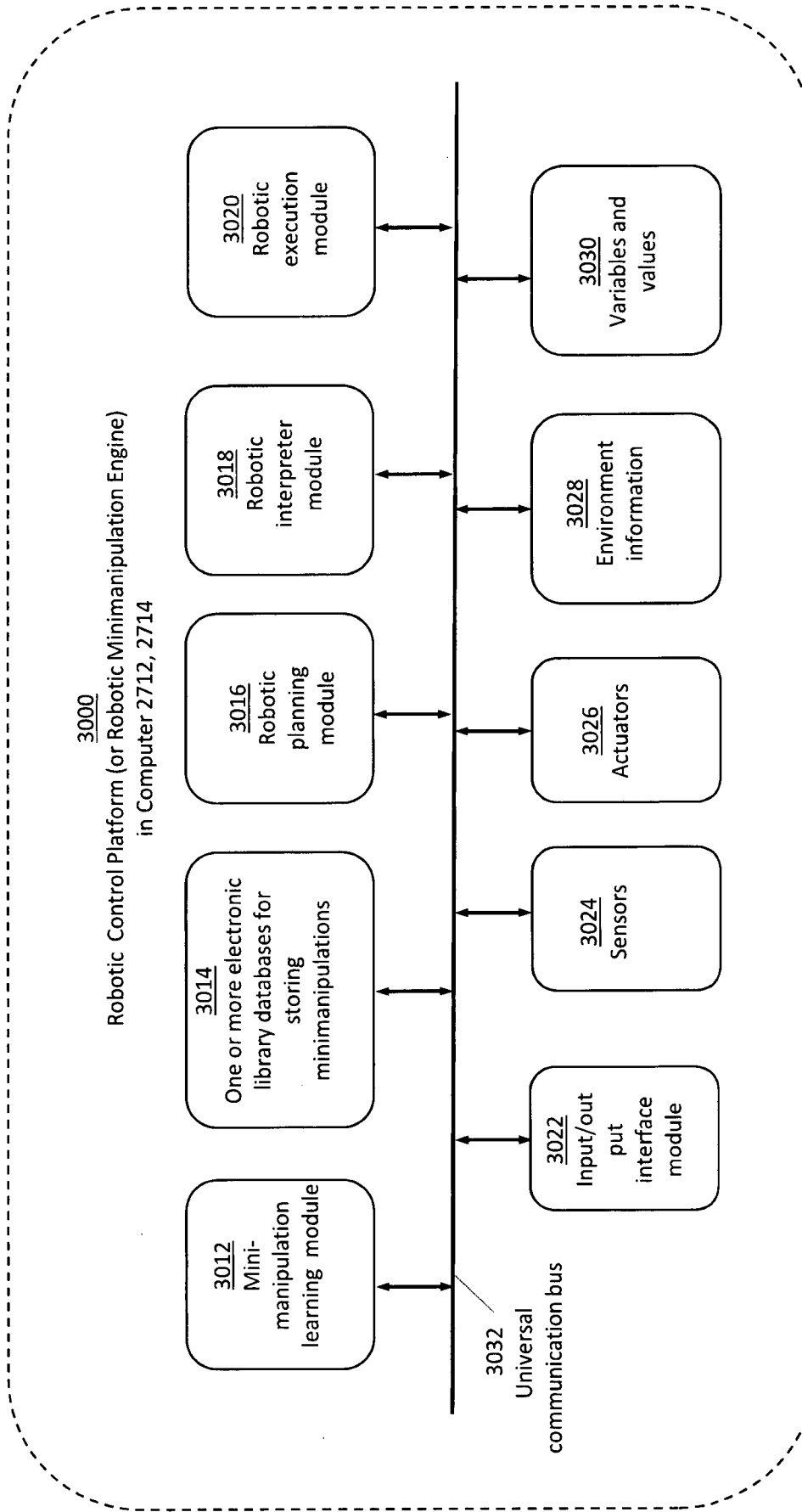


FIG. 106

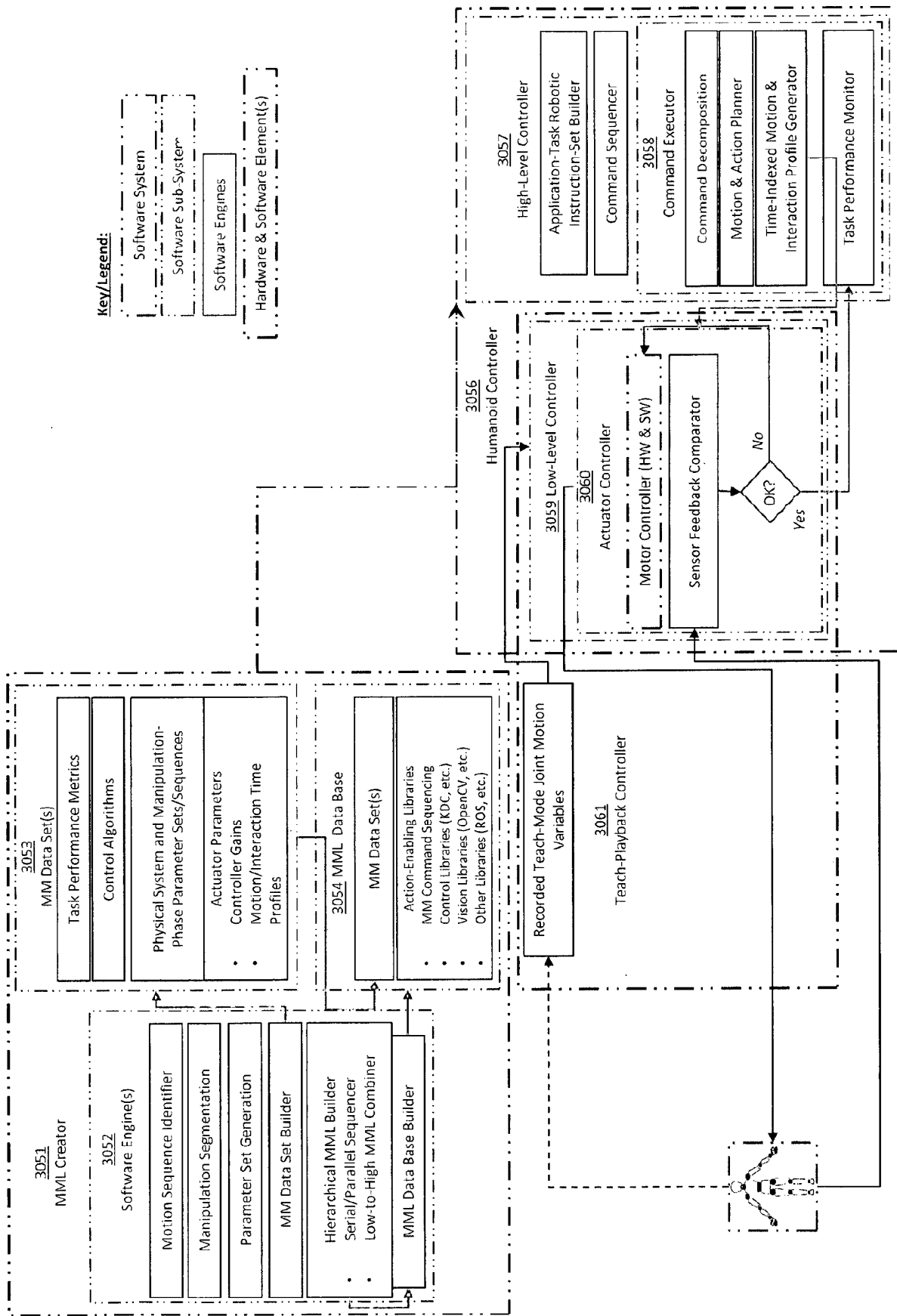


FIG. 107

3050

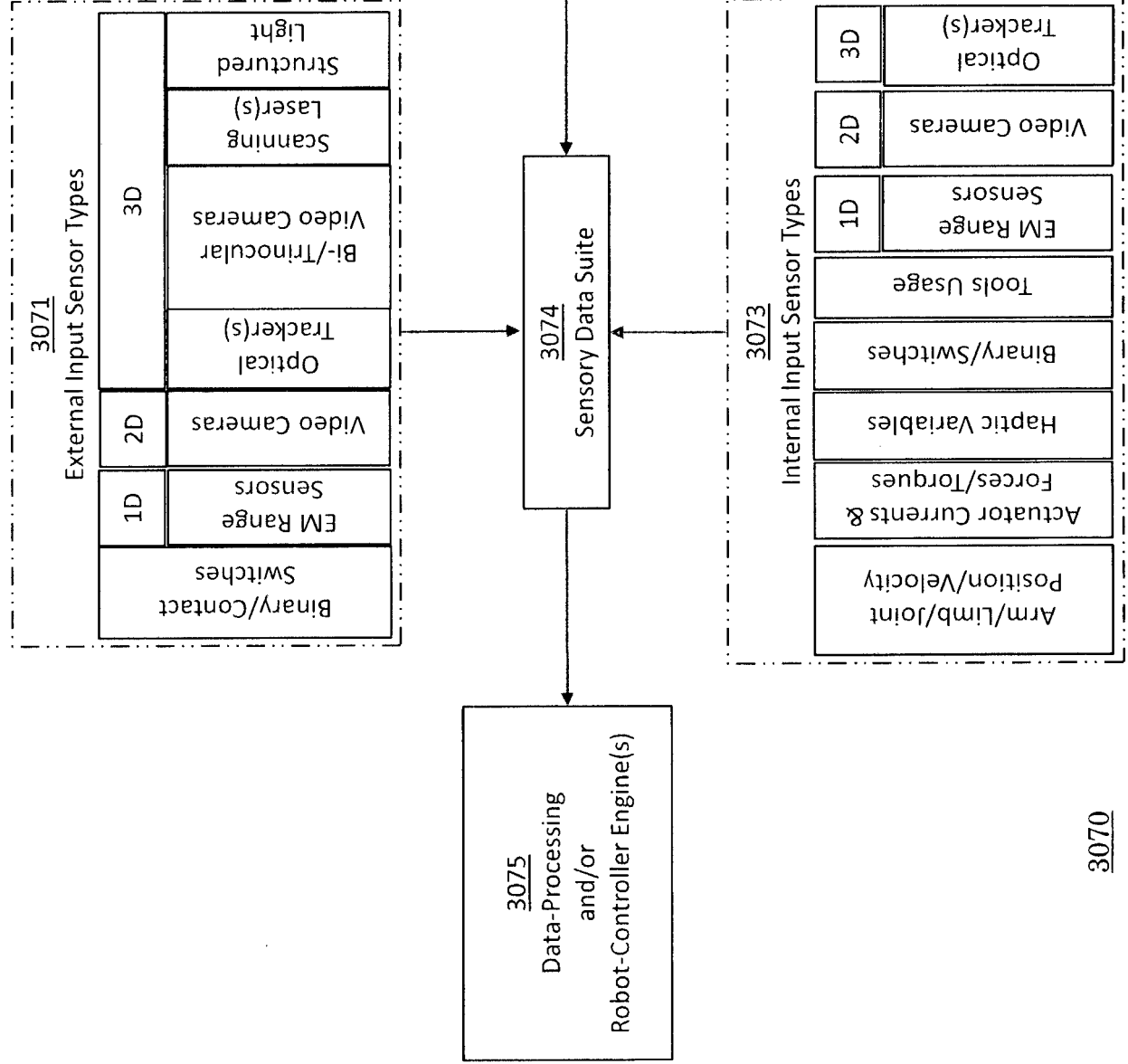


FIG. 108

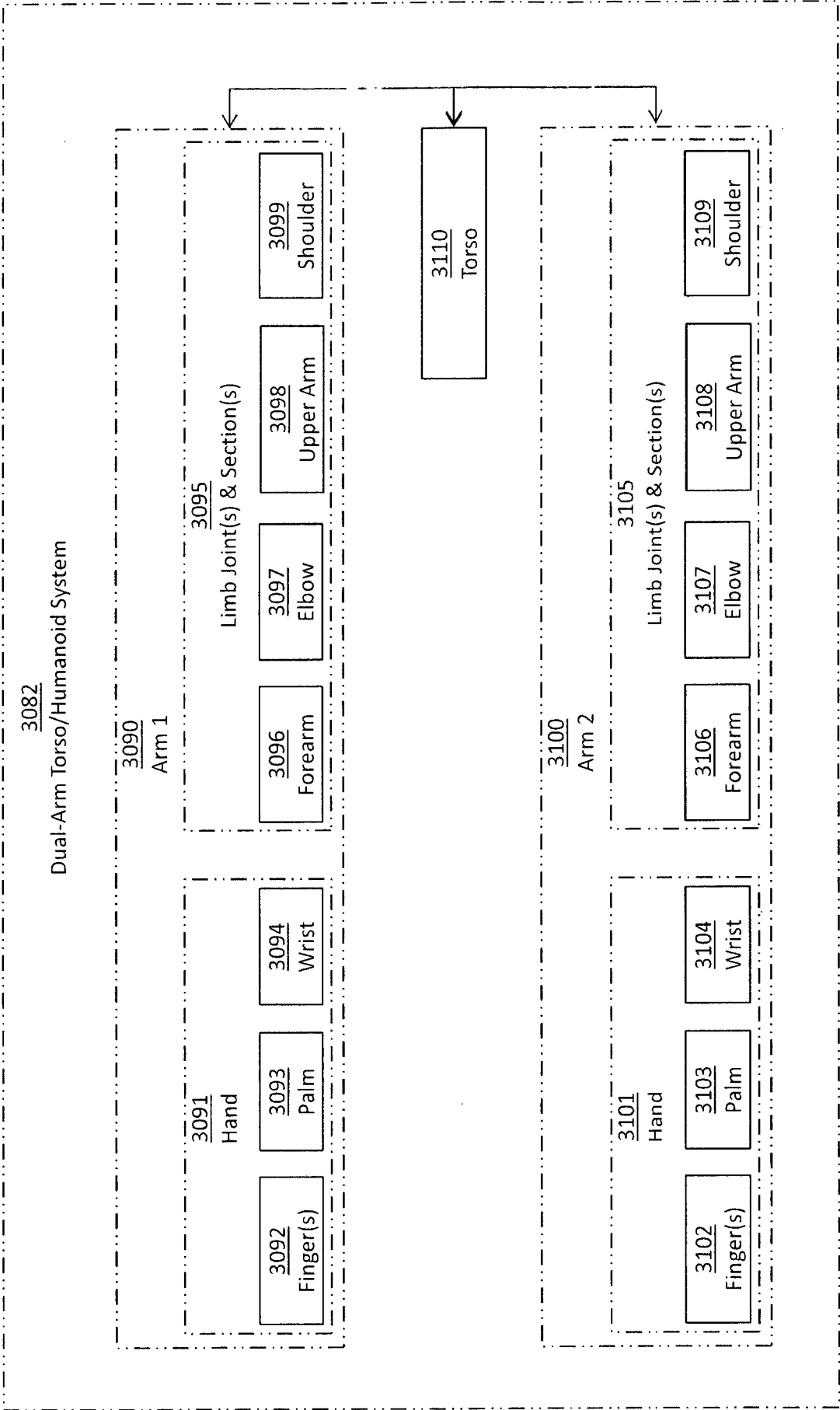


FIG. 109

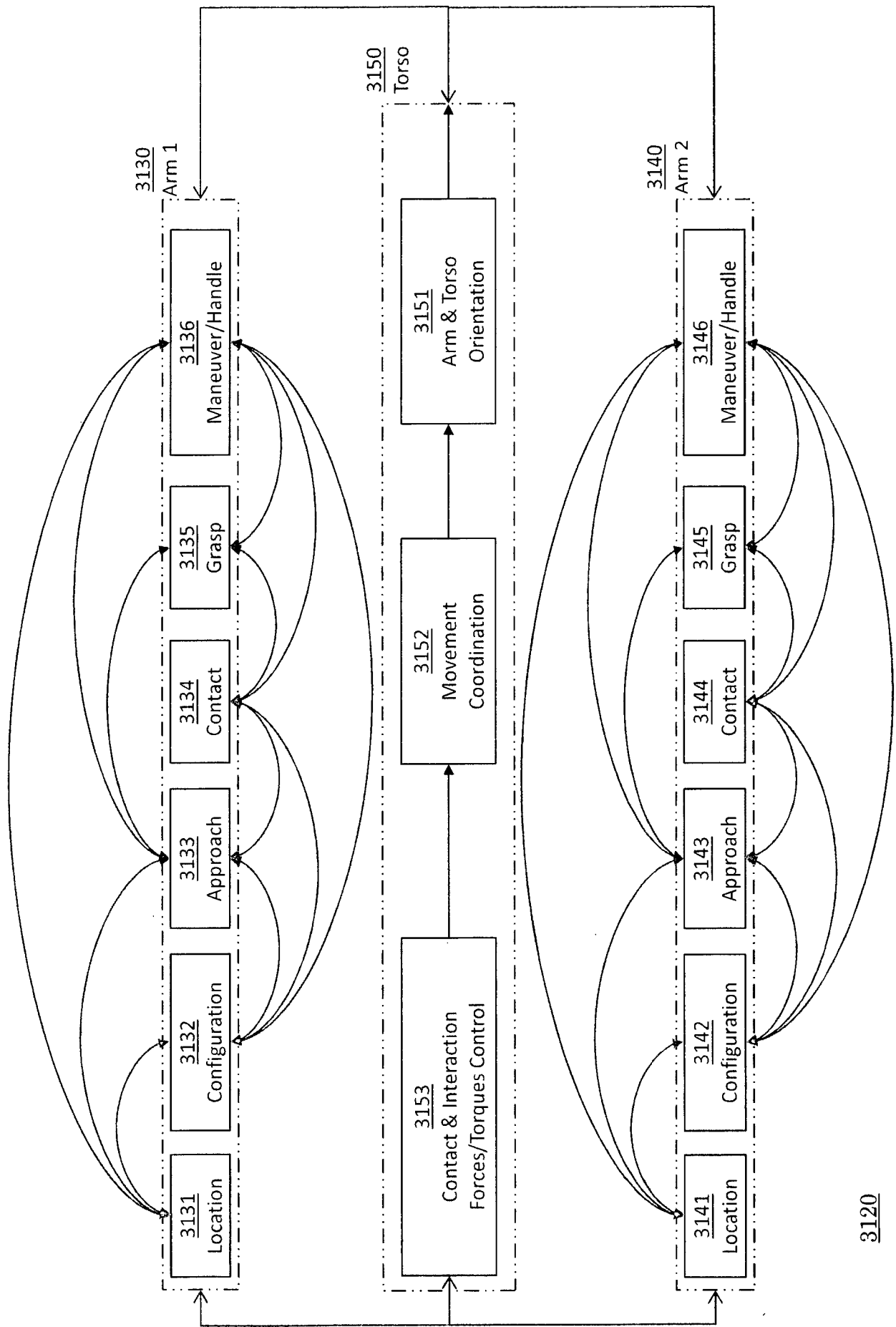


FIG. 110

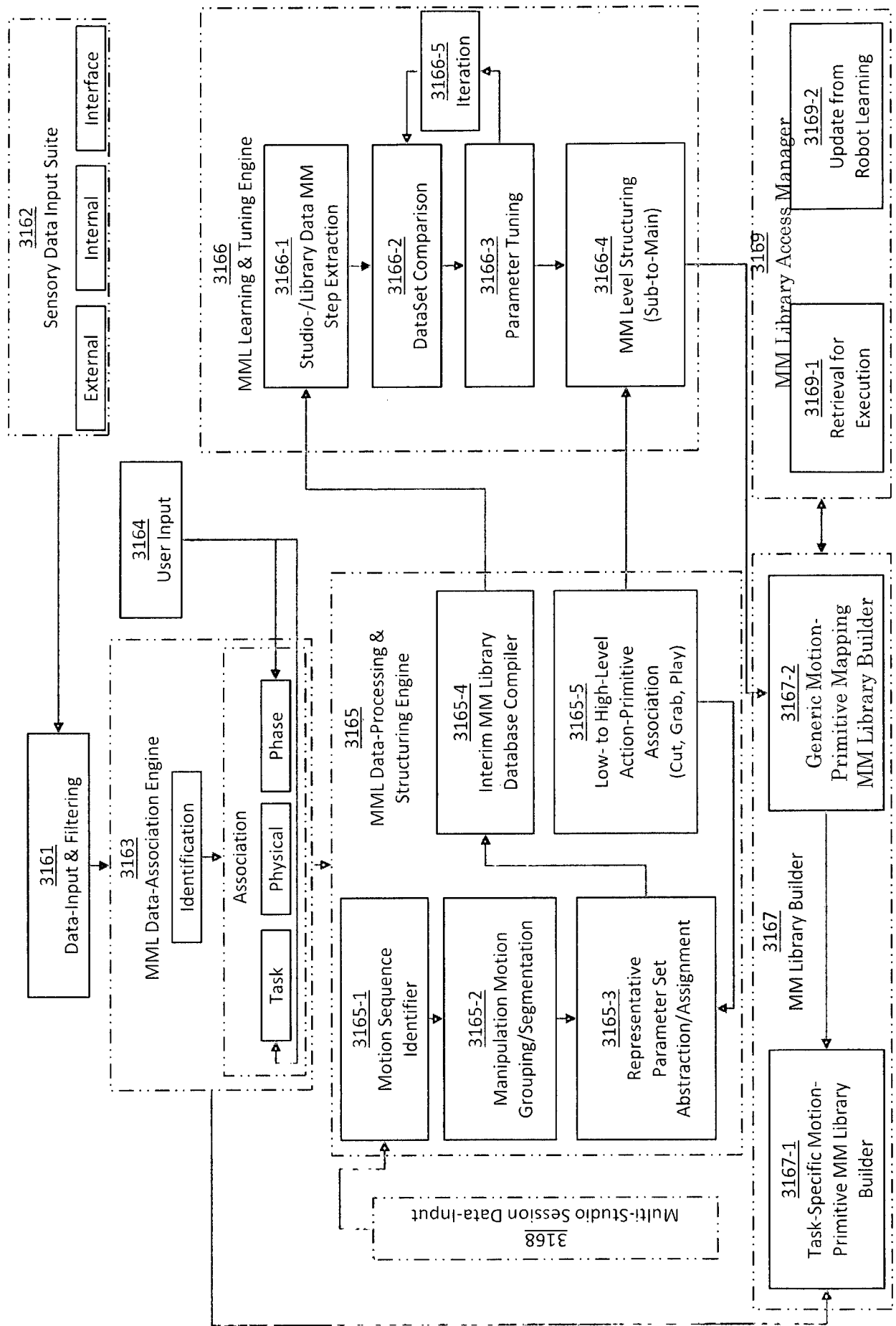
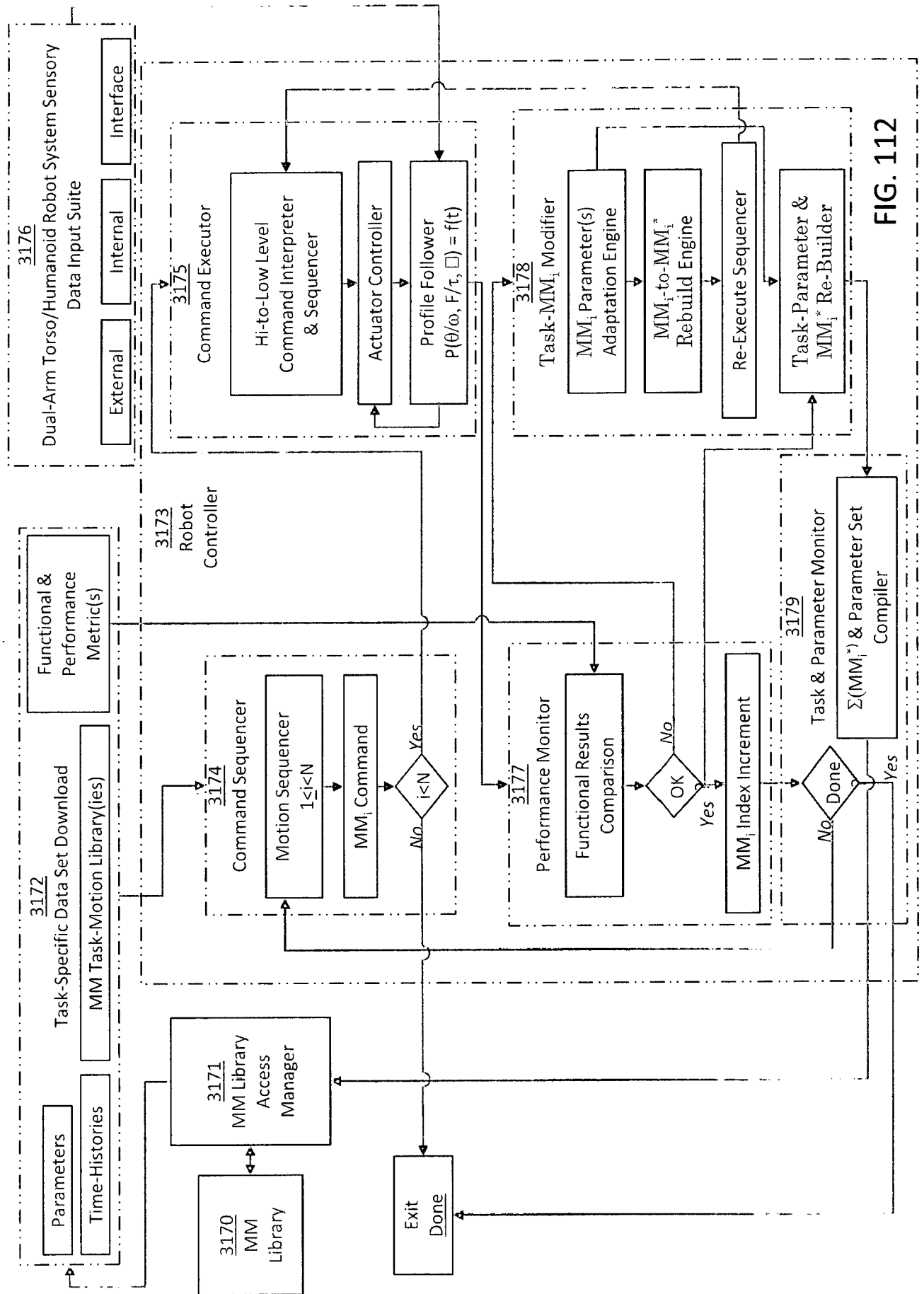


FIG. 111

3160



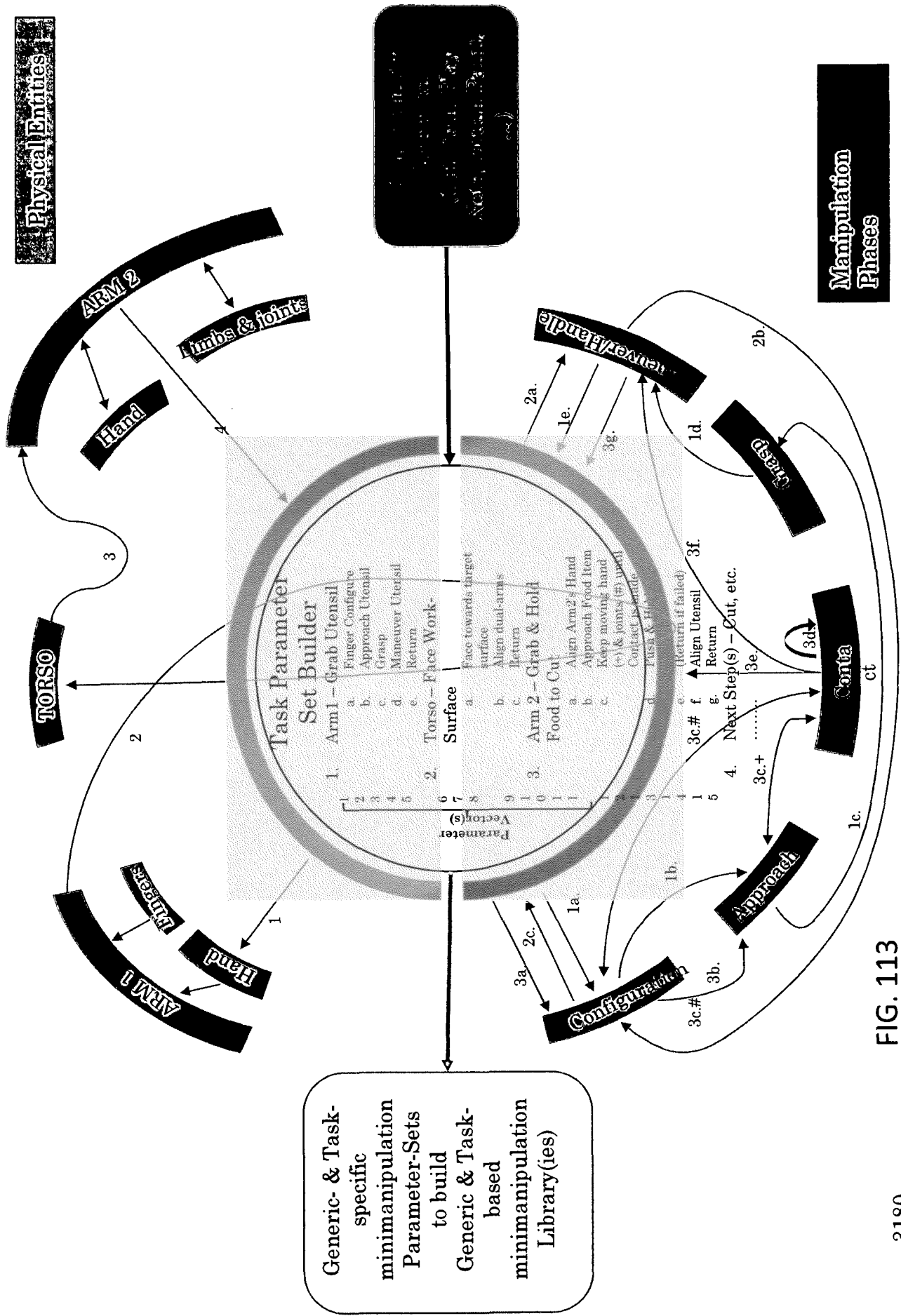


FIG. 113

Data-Centric View of the Robotic Architecture

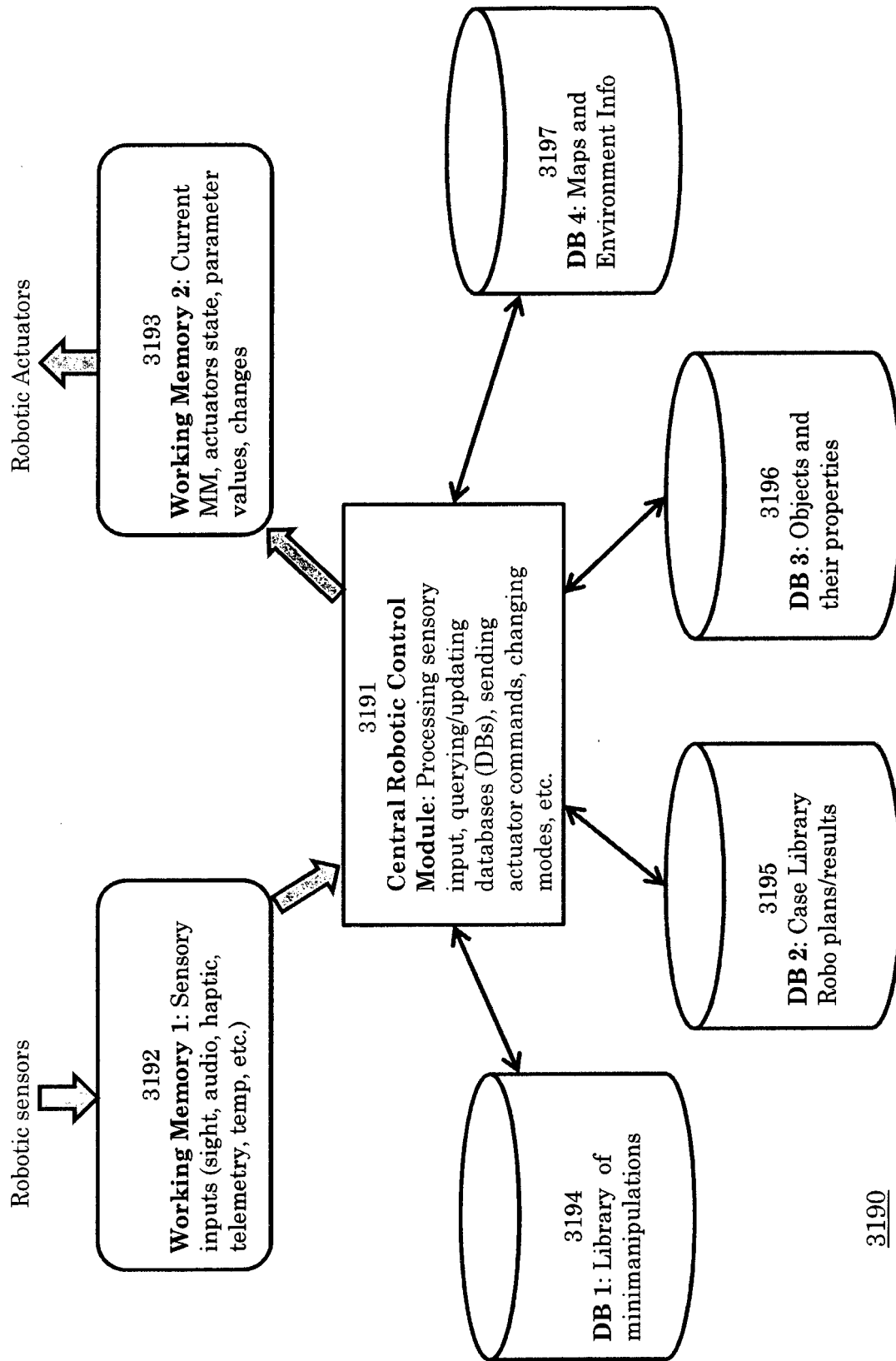
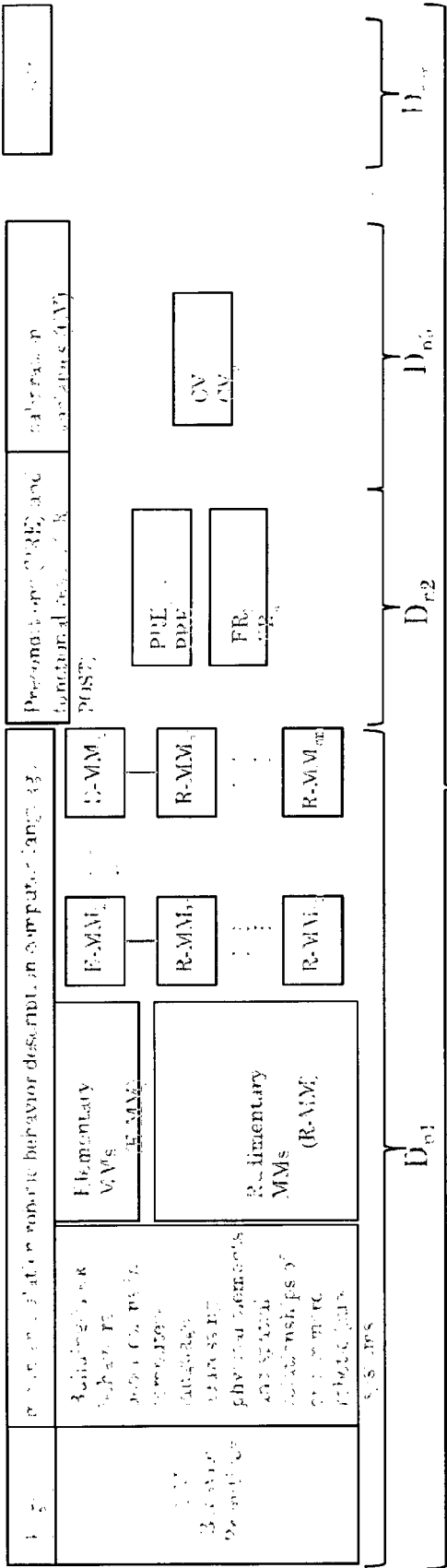


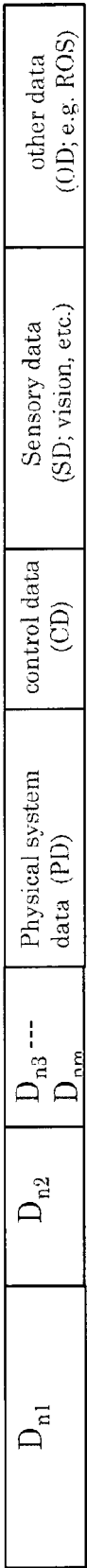
FIG. 114A

Examples of Minimanipulation (MM) Data Format

Comparison of Alternative Behavior Data



Linking Minimanipulation Robotic Behavior Data with physical domain data (to enable execution) – drawing not to scale



Conversion of Linked Minimanipulation Robotic Behavior Data (to low-level programmable-machine executable robot-instructions)

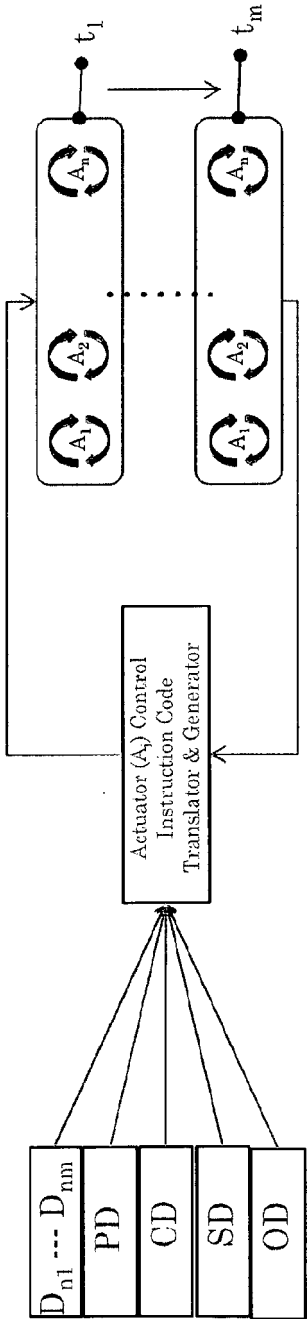
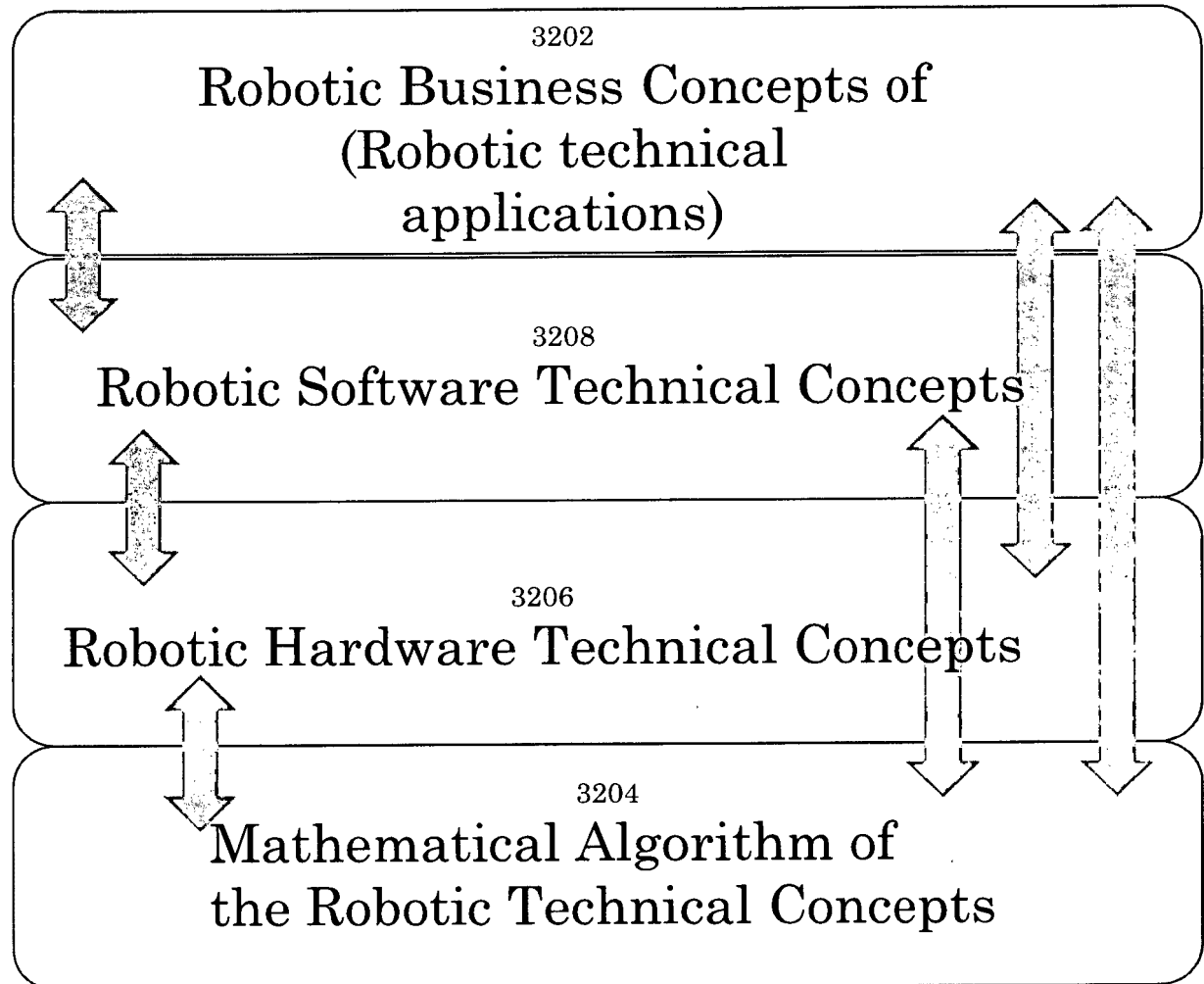


FIG. 114B

The notation “ $\dots$ ” denotes a data(-set) entry as part of a MML library

The notation “M()” denotes a machine-language execution



The bidirectional arrows denotes one or more Interactions between one or more inter-level concepts

3200

FIG. 115

3210
A pair of robotic arms with five-fingered hands

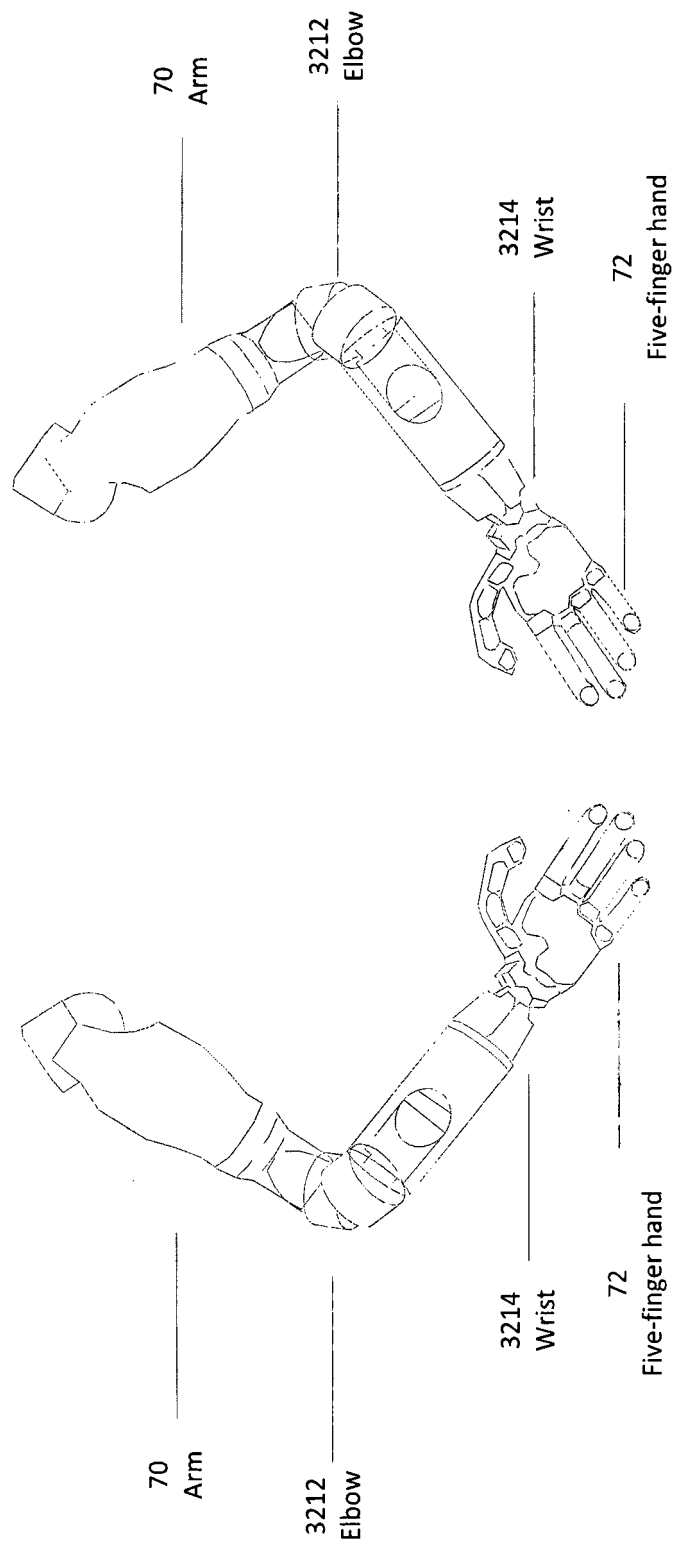


FIG. 116

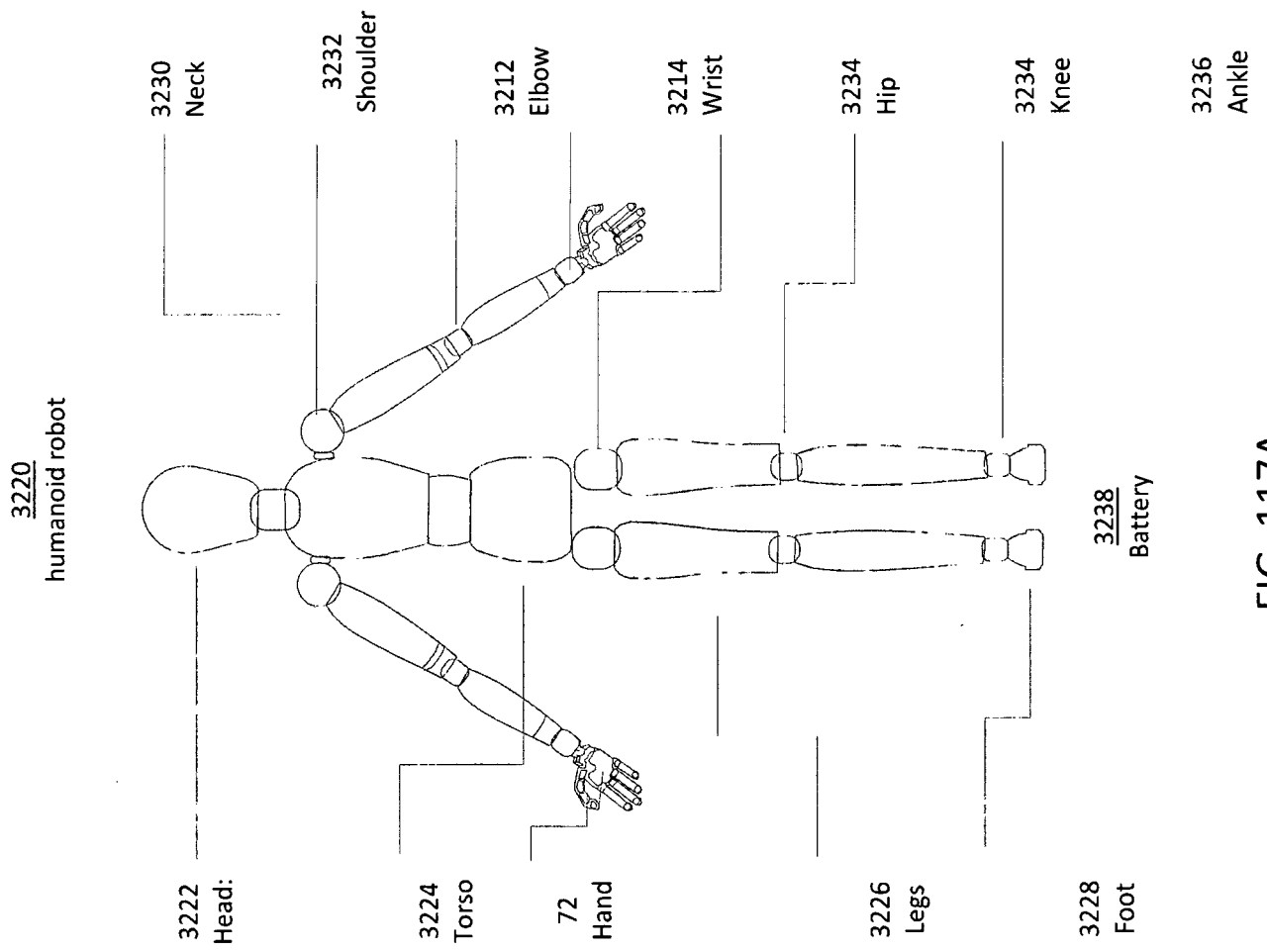


FIG. 117A

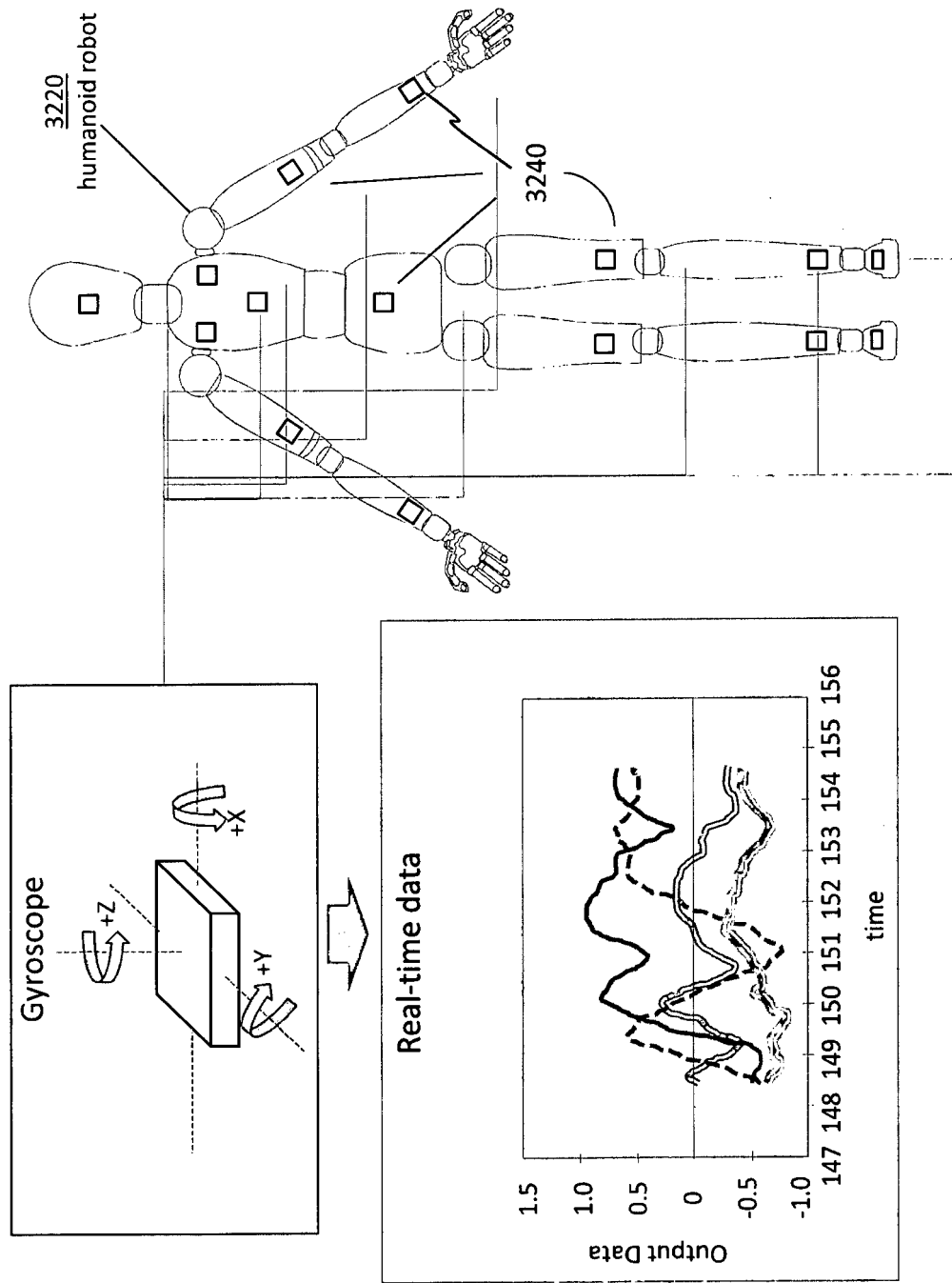
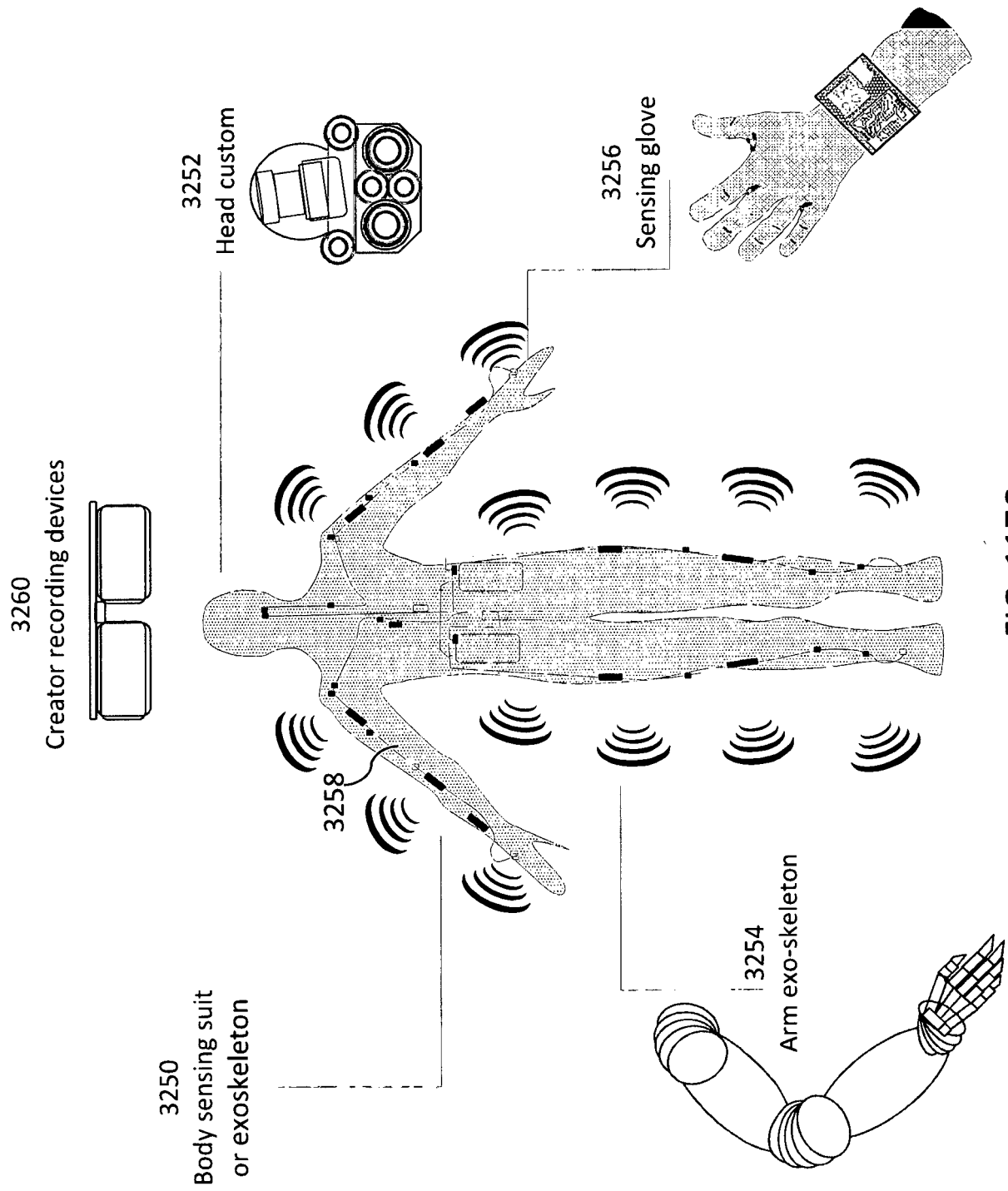


FIG. 117B



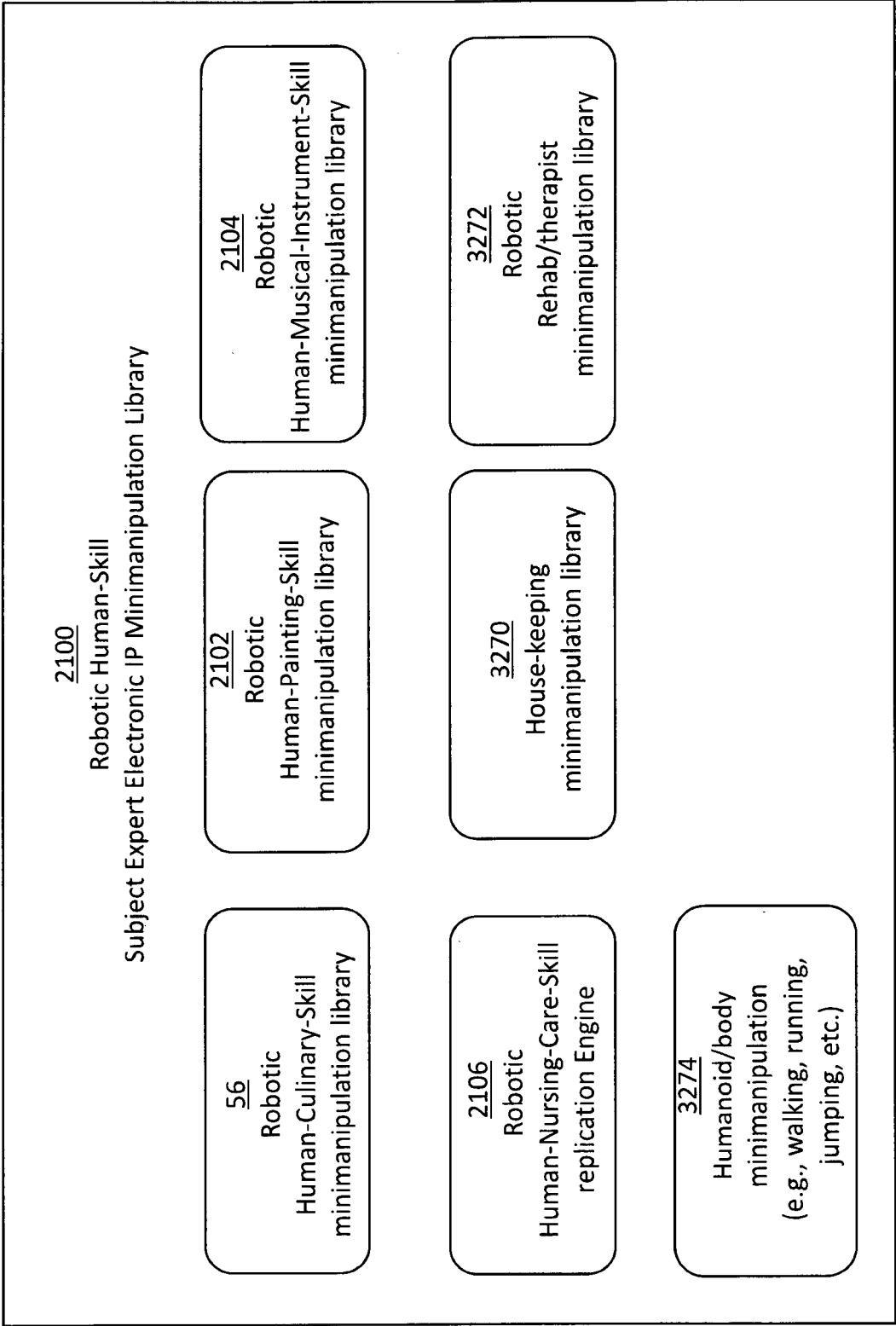


FIG. 118

3280

Creation of an Electronic Library of (Precise) minimanipulations to Ensure Obtaining Certain Functional Results in Replicating Human Hand Skill Movements for a Particular Application during the Creation Phase

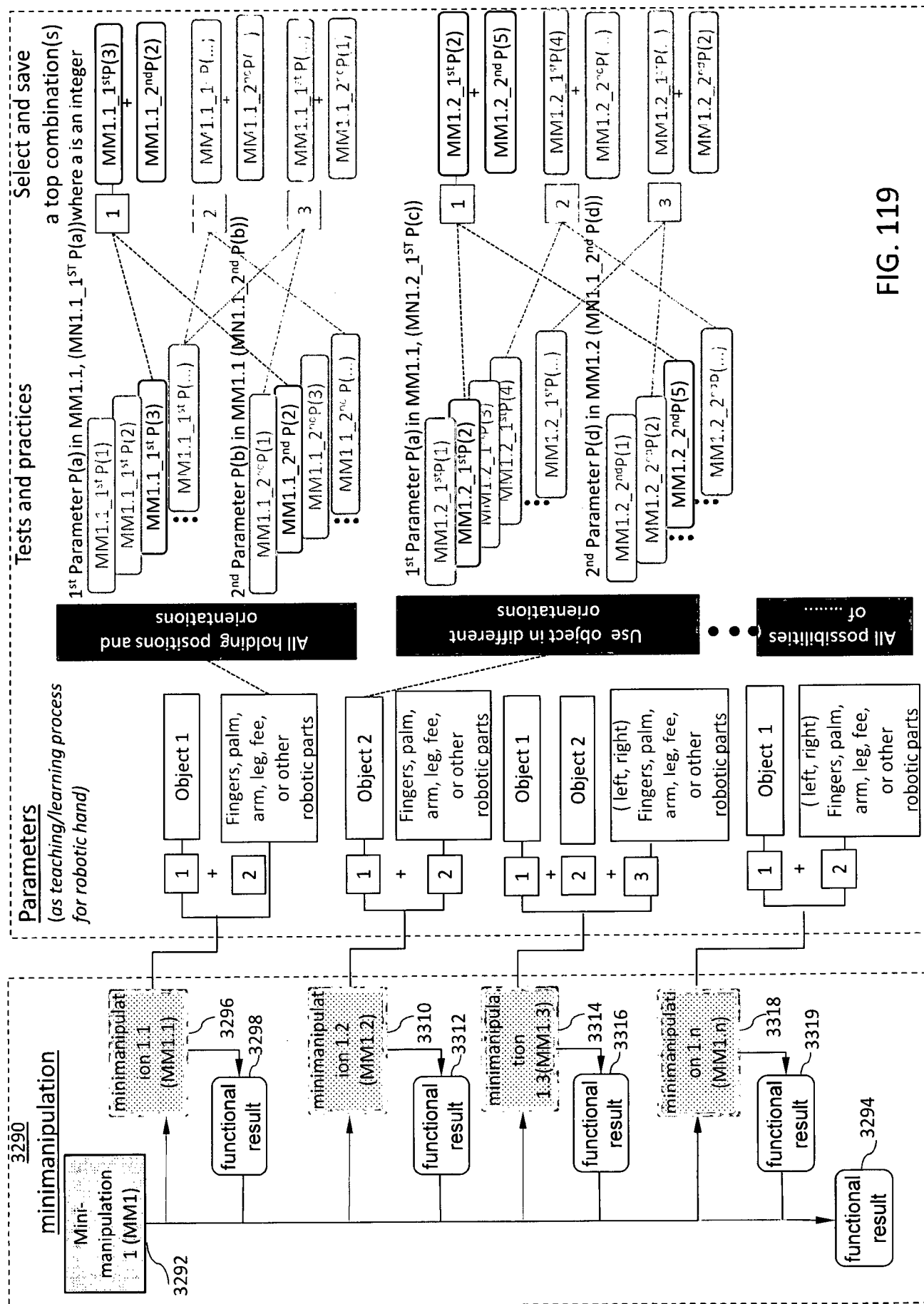


FIG. 119

3330

Performing a Task by Robot by Execution in Multiple Stages with General minimanipulations

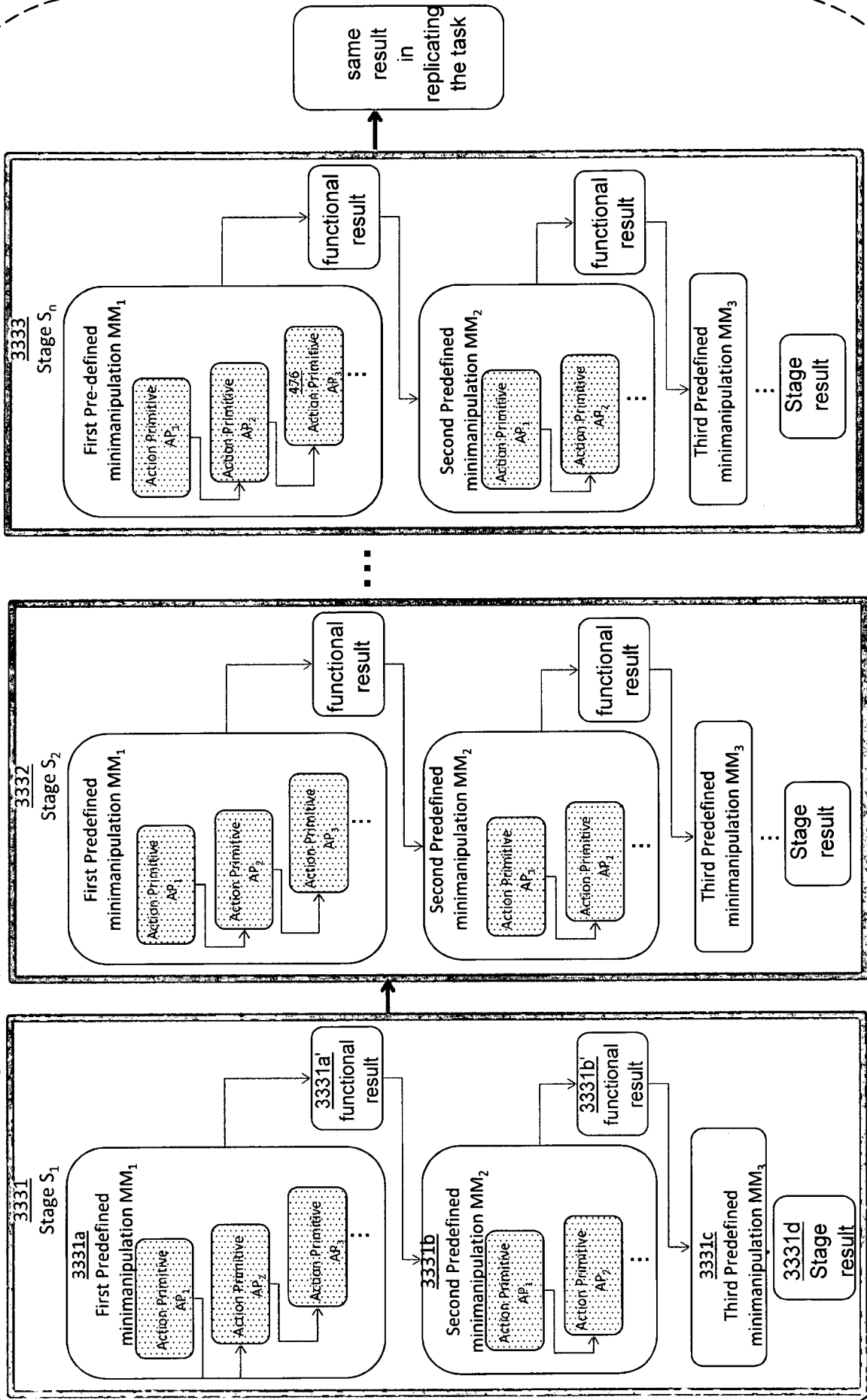


FIG. 120

Real-Time Parameter Adjustments During the Execution Phase of minimanipulations to Perform a Specific Task to Replicate a Human Hand Skill Movements

Replication Execution in Performing a Human Hand Movement Skill Task

Retrieval from minimanipulation Library

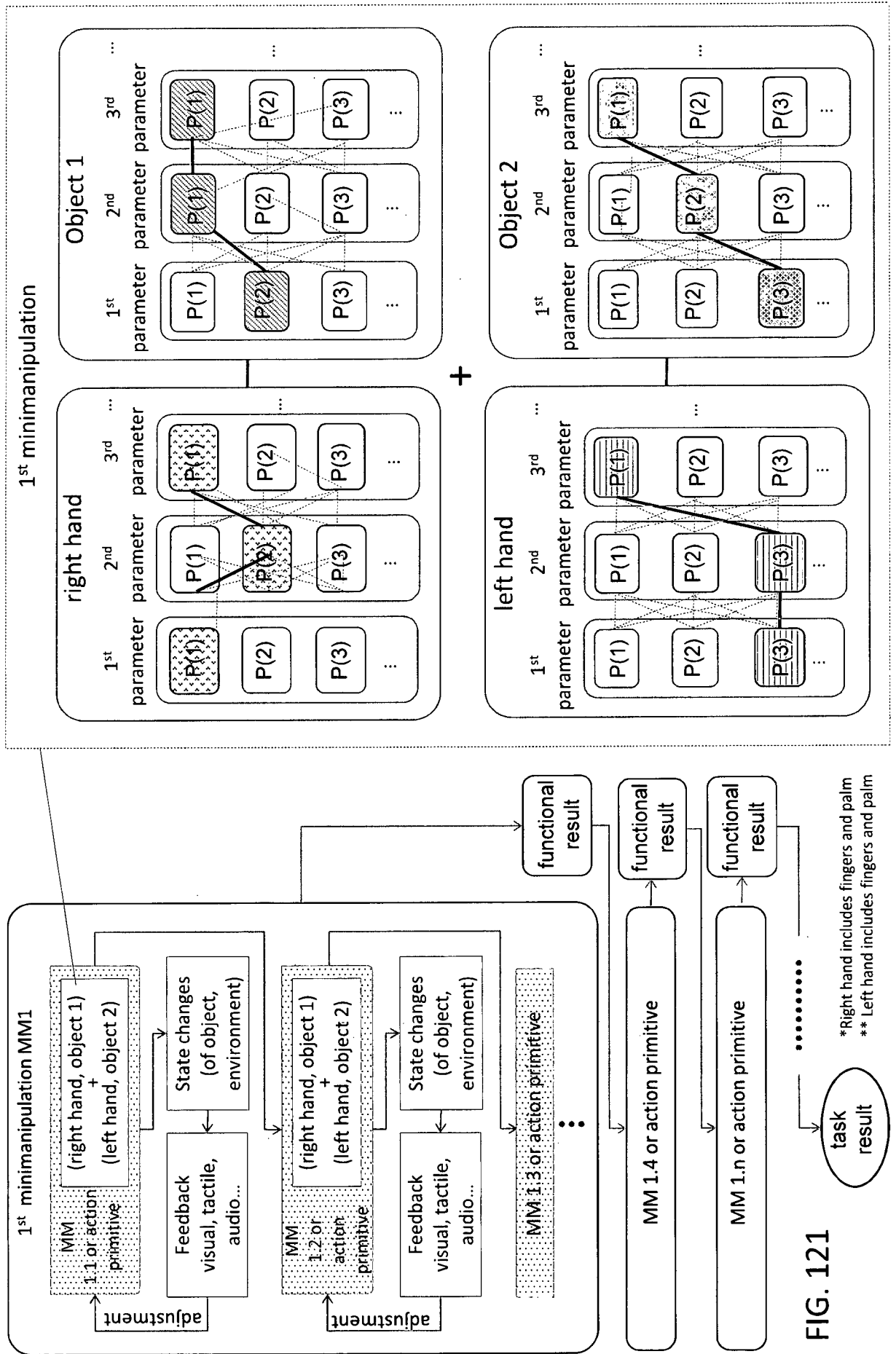


FIG. 121

*Right hand includes fingers and palm
** Left hand includes fingers and palm

Subject expert function result and minimanipulation library
example: making Sushi

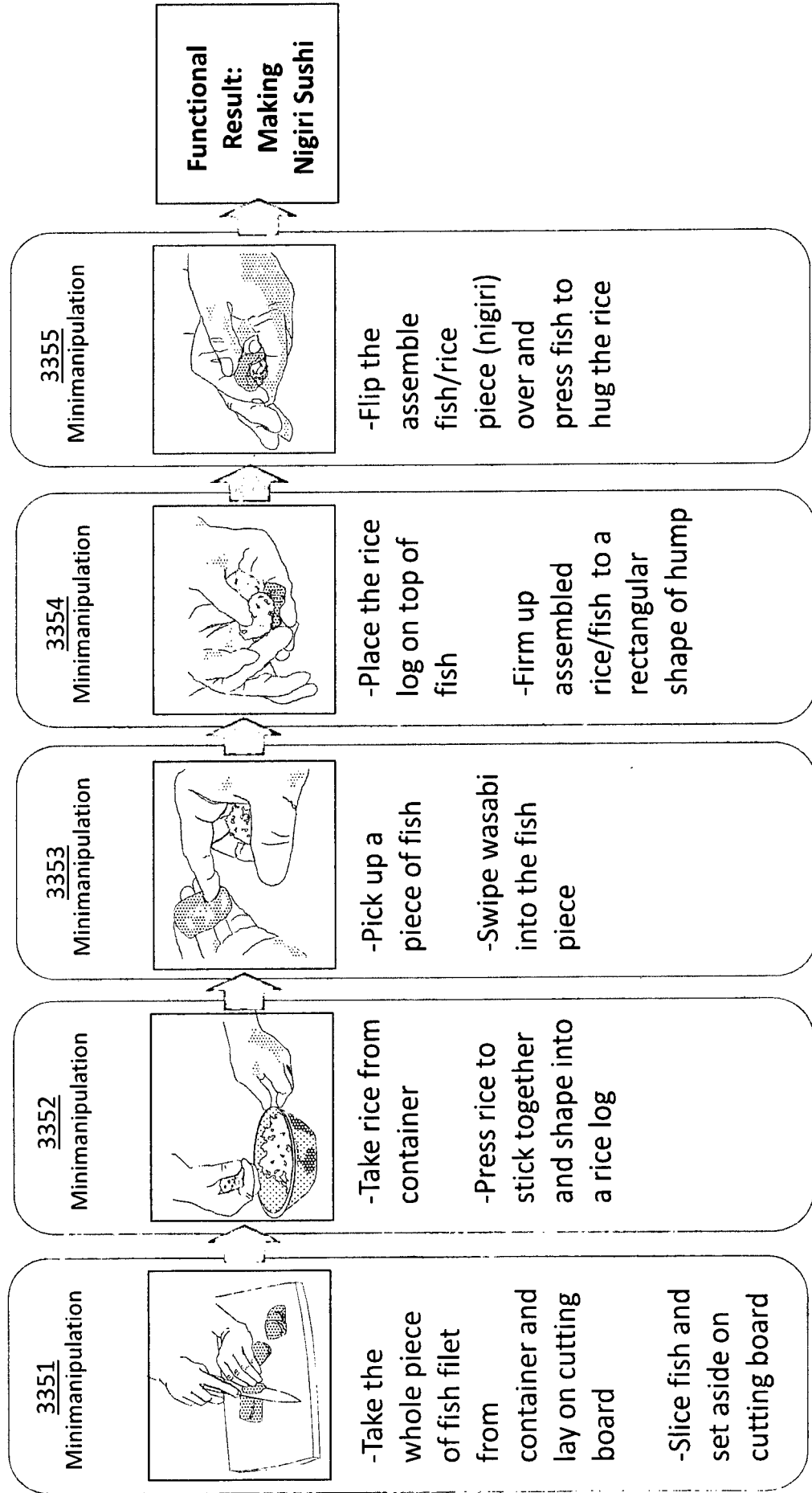
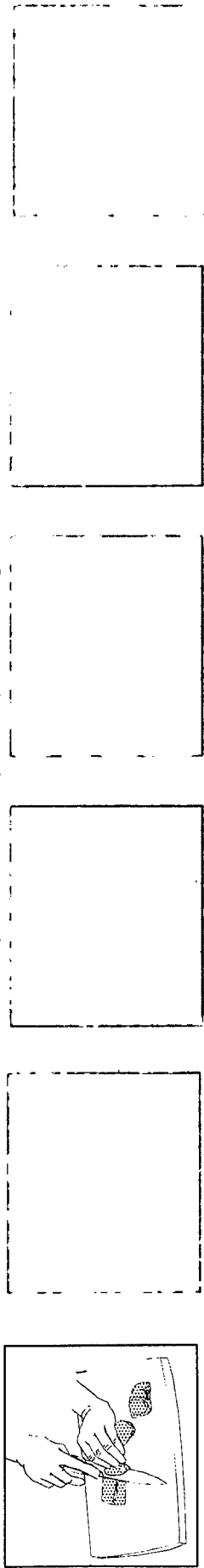


FIG. 122

Subject expert function result and
minimanipulation library example: making Sushi



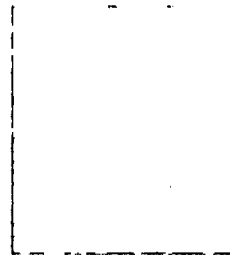
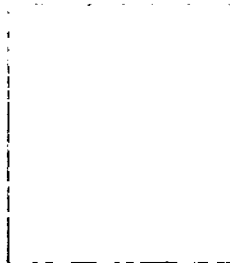
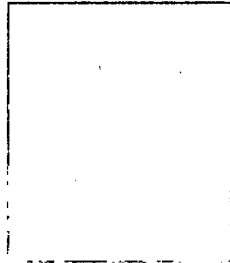
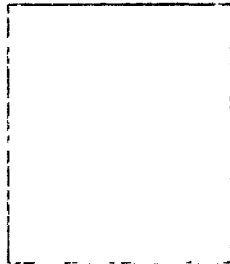
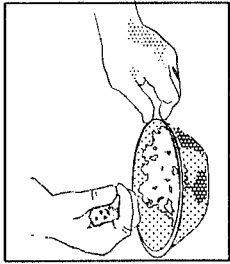
minimanipulation and parameters: Take the whole piece of fish fillet from container and lay on cutting board 3351a

Parameter(variable) value as initially captured in cooking process or defined by creator, or obtaining from three-dimensional volume scanning real time process, or predefined parameters				Application parameters (generated from 3D vision), or predefined parameters
Time	(Right) Hand and fingers	(Left) Hand and fingers	Temporary non-standard object library	Standard object
Starting and ending	XYZ position and orientation pressure to take out whole fish fillet and put on cutting board	XYZ position and orientation pressure to hold container to keep from moving	<u>Fish fillet:</u> -Size, shape, weight -XYZ position and orientation in container -XYZ position and orientation on the cutting board	<u>Fish fillet container:</u> XYZ position and orientation <u>Cutting board:</u> XYZ position and orientation

minimanipulation and parameters: slice fish and set aside on cutting board 3351b

Parameter(variable) value as initially captured in cooking process or defined by creator, or obtaining from three-dimensional volume scanning real time process, or predefined parameters				Application parameters (generated from 3D vision), or predefined parameters
Time	(Right) Hand and fingers	(Left) Hand and fingers	Temporary non-standard object library	Standard object
Starting and ending	XYZ position and orientation pressure to hold knife pressure, angle to cut fish and to move each sliced piece aside on the cutting board	XYZ position and orientation pressure on fish fillet to keep from moving	<u>Fish piece:</u> -size, shape, thickness, weight of sliced fish -XYZ position and orientation on the cutting board	<u>Knife:</u> XYZ position and orientation, <u>cutting board:</u> XYZ position and orientation

Subject expert function result and mini-manipulation library example: making Sushi



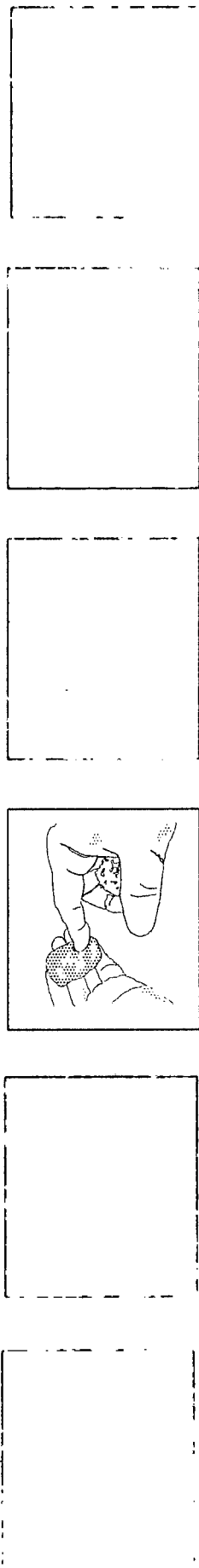
minimanipulation and parameters: Take rice from container 3352a

Parameter(variable) value as initially captured in cooking process or defined by creator					Pre-defined parameter
Time	(Right) Hand and fingers	(Left) Hand and fingers	Temporary non-standard object library	Standard object	
Starting and ending	-XYZ position and orientation -Pressure to take out rice from container and hold the rice piece	-XYZ position and orientation -Pressure to hold the rice container to keep from moving	<u>rice:</u> -XYZ position in the container -Amount to take	rice container: XYZ position and orientation	

minimanipulation and parameters: press rice to stick together and shape into a rice log 3352b

Starting and ending	-XYZ position and orientation -Pressure to hold and press the rice	-XYZ position and orientation -Pressure to hold and press the rice	<u>Rice log:</u> -Size and shape -XYZ position and orientation
---------------------	---	---	--

Subject expert function result and mini-manipulation library example: making Sushi



minimanipulation and parameters: Pick up a piece of fish 3353a

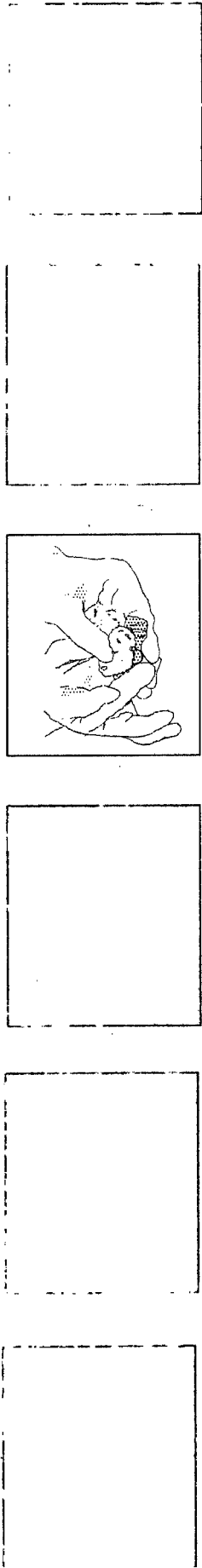
Parameter(variable) value as initially captured in cooking process or defined by creator				Pre-defined parameter
Time	(Right) Hand and fingers	(Left) Hand and fingers	Temporary non-standard object library	Standard object
Starting and ending	-XYZ position and orientation -Pressure to hold the rice log	-XYZ position and orientation -Pressure to take targeted fish piece from cutting board	<u>Rice log:</u> XYZ position and orientation in right hand . <u>Fish piece:</u> -XYZ position and orientation on cutting board. -XYZ position and orientation in left hand.	<u>Wasabi container:</u> XYZ position and orientation

minimanipulation and parameters: Swipe wasabi into the fish piece 3353b

Starting and ending	-XYZ position and orientation -pressure to hold the rice log -Pressure to take wasabi piece	-XYZ position and orientation -Pressure to hold fish piece	<u>Wasabi piece :</u> XYZ position and orientation with premeasured amount in container, or take a certain amount in real time <u>Fish piece:</u> -XYZ position and orientation in left hand -Spot of XYZ position to swipe wasabi into.	<u>Wasabi container:</u> XYZ position and orientation
---------------------	---	---	--	--

FIG. 125

Subject expert function result and mini-manipulation library example: making Sushi



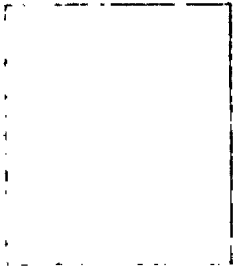
minimanipulation and parameters:
Place the rice log on top of fish and firm up assembled rice/fish to a rectangular shape of hump

Parameter (variable) value as initially captured in cooking process or defined by creator				Pre-defined parameter
Time	(Right) Hand and fingers	(Left) Hand and fingers	Temporary non-standard object library	Standard object
Starting and ending	-XYZ position and orientation -Pressure to press rice log to fish piece	-XYZ position and orientation -Pressure to take targeted fish piece from cutting board	<u>Rice log:</u> XYZ position and orientation in right hand <u>Fish piece:</u> XYZ position and orientation in left hand.	<u>Wasabi container:</u> XYZ position and orientation

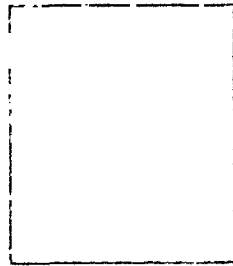
3354

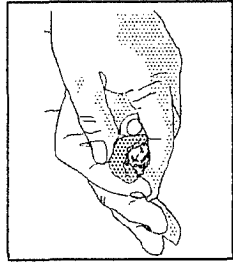
FIG. 126

Subject expert function result and mini-manipulation library example: making Sushi









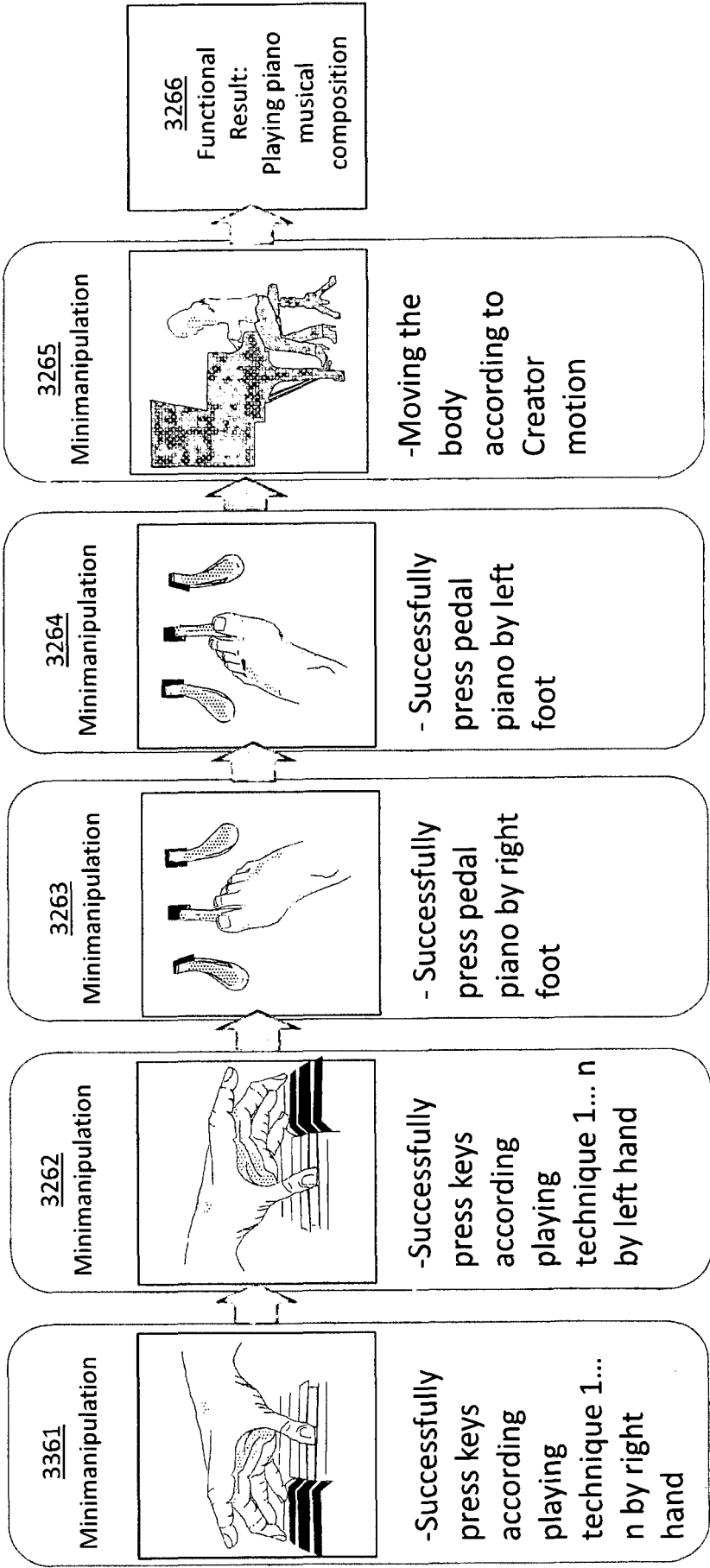
Functional Result:
Making Nigiri Sushi

minimanipulation and parameters: :
Flip the assembled rice/fish piece (nigiri) over and press fish to hug the rice 3355

Parameter (variable) value as initially captured in cooking process			Parameter (variable) value as initially captured in cooking process or defined by creator
Time	(Right) Hand and fingers	(Left) Hand and fingers	Temporary non-standard object library
Starting and ending	-XYZ position and orientation -Pressure to press and shape assembled rice/fish piece(nigiri)	-XYZ position and orientation -Pressure to press and shape assembled rice/fish piece(nigiri)	<u>Assembled fish/rice piece (nigiri)</u> : -XYZ position and orientation in hands -Shape, dimension

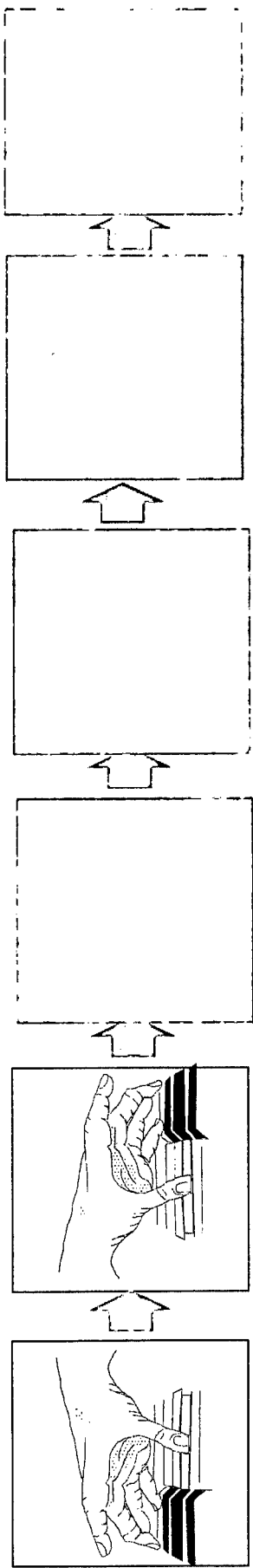
FIG. 127

Subject expert function result and minimanipulation library example: Playing piano musical composition replicating a particular music piece (dependent on time and place) by a musician



3360

FIG. 128



minimanipulation and parameters: Successfully press keys according playing technique 1... n by right hand

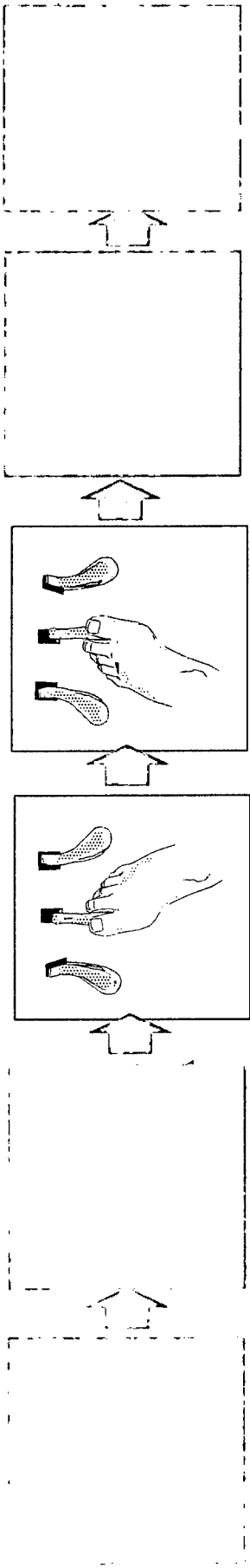
Parameter (variable) value as initially captured in piano playing process or defined by creator		Pre-defined parameter
Time	(Right) Hand and fingers	Standard object
Time each finger pressing starting and ending period	Define the number of pressing technique for each time period (one time pressing key period, or holding time) – a particular time cycle, where the time cycle could be the same time duration or different time duration	<u>Piano keys:</u> Assign each finger to exact key

minimanipulation and parameters: Successfully press keys according playing technique 1... n by left hand

parameter(variable) value as initially captured in piano playing process or defined by creator		pre-defined parameter
Time	(Left) Hand and fingers	Standard object
Time each finger pressing starting and ending period	Define the number of pressing technique for each time period (one time pressing key period, or holding time)	<u>Piano keys:</u> Assign each finger to exact key

FIG. 129

Subject expert function result and minimanipulation library
example: Playing piano musical composition



minimanipulation and parameters: Successfully press piano pedal by right foot

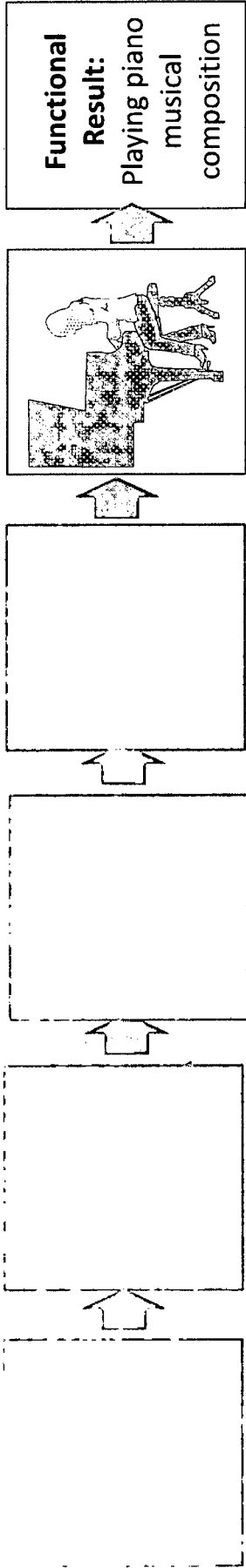
Parameter (variable) value as initially captured in piano playing process or defined by creator			Pre-defined parameter
Time	(Right) Foot		Standard object
Time each foot pressing starting and ending period	Define the number of pressing technique for each time period (one time pressing key period, or holding time)		<u>Piano pedals:</u> Assigning each feet to sufficient pedal

minimanipulation and parameters: Successfully press piano pedal by left foot

Parameter (variable) value as initially captured in piano playing process or defined by creator			Pre-defined parameter
Time	(Left) Foot		Standard object
Time each foot pressing starting and ending period	Define the number of pressing technique for each time period (one time pressing key period, or holding time)		<u>Piano pedals:</u> Assigning each feet to sufficient pedal

FIG. 130

Subject expert function result and minimanipulation library
example: Playing piano musical composition

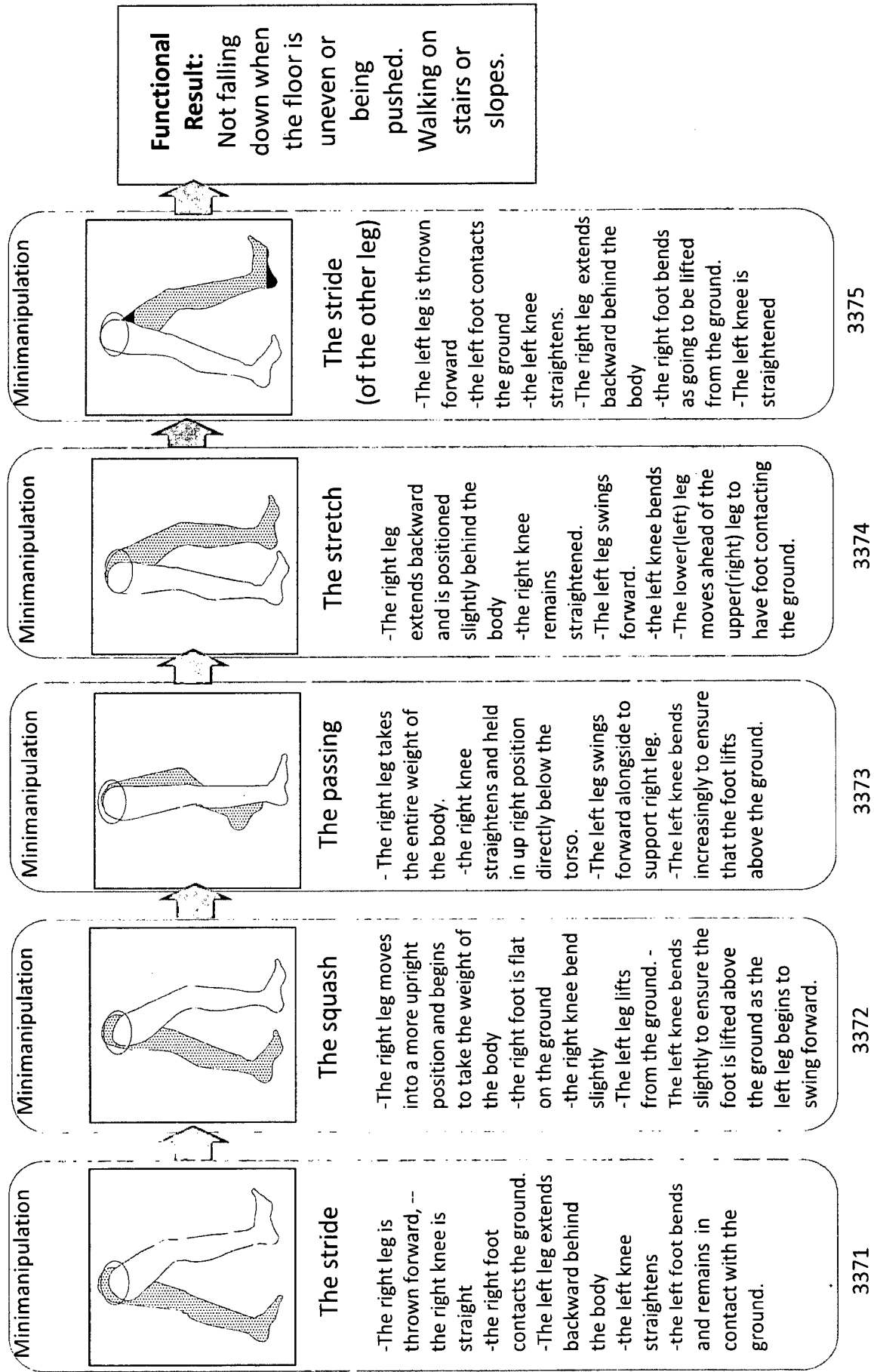


minimanipulation and parameters: Moving the body according Creator motion

Parameter (variable) value as initially captured in piano playing process or defined by creator	
Time	Body
Time of staring and ending motions	XVZ initial body position XVZ ending body position in each period of time (one time one direction moving body period

FIG. 131

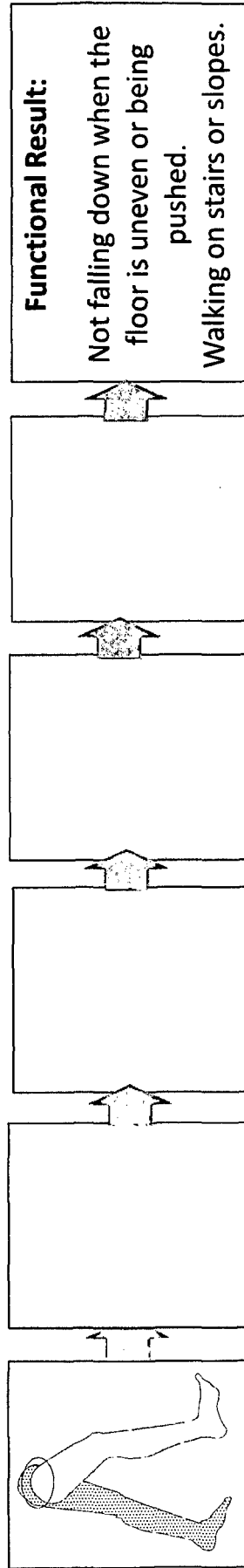
General function result and minimanipulation library example: Moving by walking from A-position to B-position –based on natural human walking



3370

FIG. 132

General function result and minimanipulation library example: Moving by walking from A-position to B-position –based on natural human walking

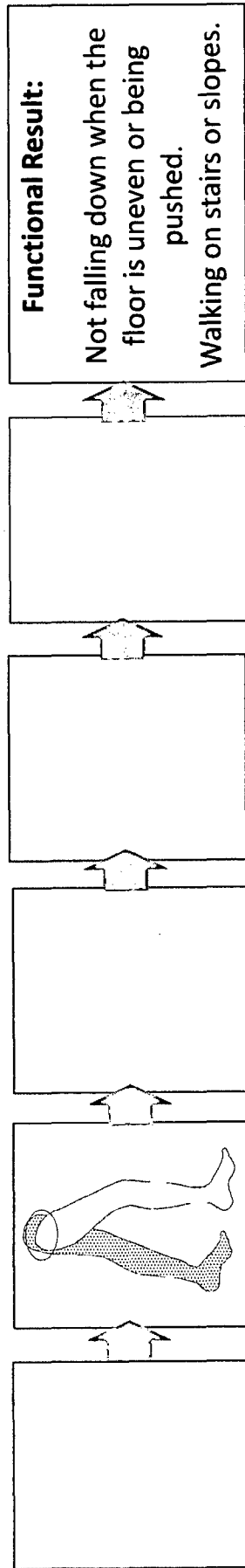


minimanipulation and parameters: the stride 3371

pre-defined parameter						
time	right			left		
	Leg	Knee	Foot	Leg	Knee	Foot
Starting and ending	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground
						others
						-body: location of center gravity -Joints: vectors at the joints during walking and ground reaction

FIG. 133

General function result and minimanipulation library example: Moving by walking from A-position to B-position –based on natural human walking

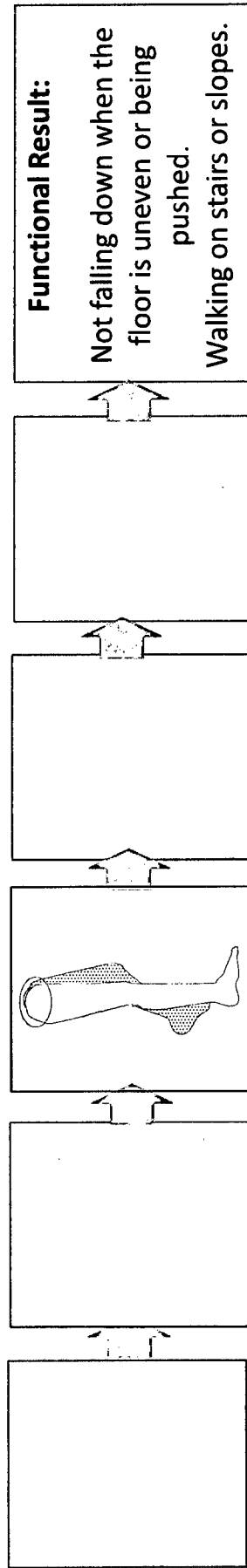


minimanipulation and parameters: the squash 3372

pre-defined parameter						
time	right			left		
	Leg	Knee	Foot	Leg	Knee	Foot
Starting and ending	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground
						others
						-body: location of center gravity -Joints: vectors at the joints during walking and ground reaction

FIG. 134

General function result and minimanipulation library example: Moving by walking from A-position to B-position –based on natural human walking

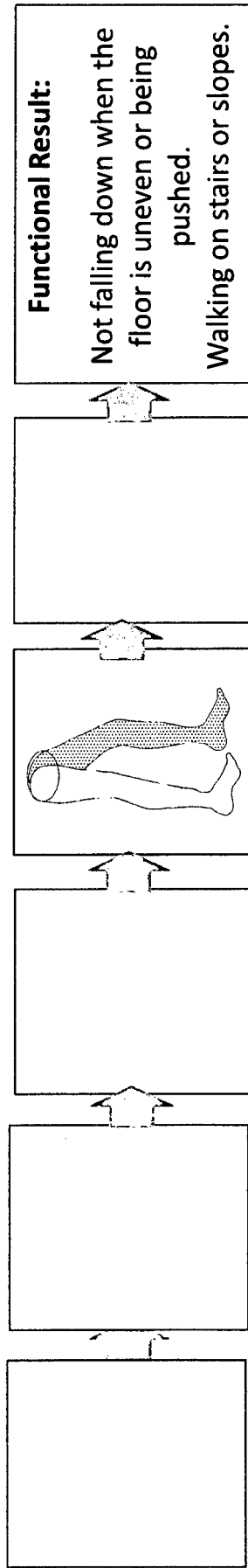


minimanipulation and parameters: the passing 3373

pre-defined parameter						
time	right			left		
	Leg	Knee	Foot	Leg	Knee	Foot
Starting and ending	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground
						others
						-body: location of center gravity -Joints: vectors at the joints during walking and ground reaction

FIG. 135

General function result and minimanipulation library example: Moving by walking from A-position to B-position –based on natural human walking

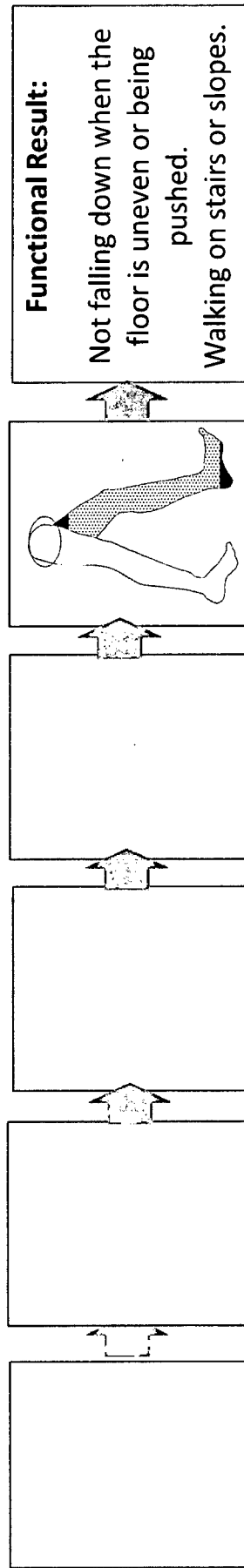


minimanipulation and parameters: the stretch 3374

pre-defined parameter						
time	right			left		
	Leg	Knee	Foot	Leg	Knee	Foot
Starting and ending	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground
						others
						-body: location of center gravity -Joints: vectors at the joints during walking and ground reaction

FIG. 136

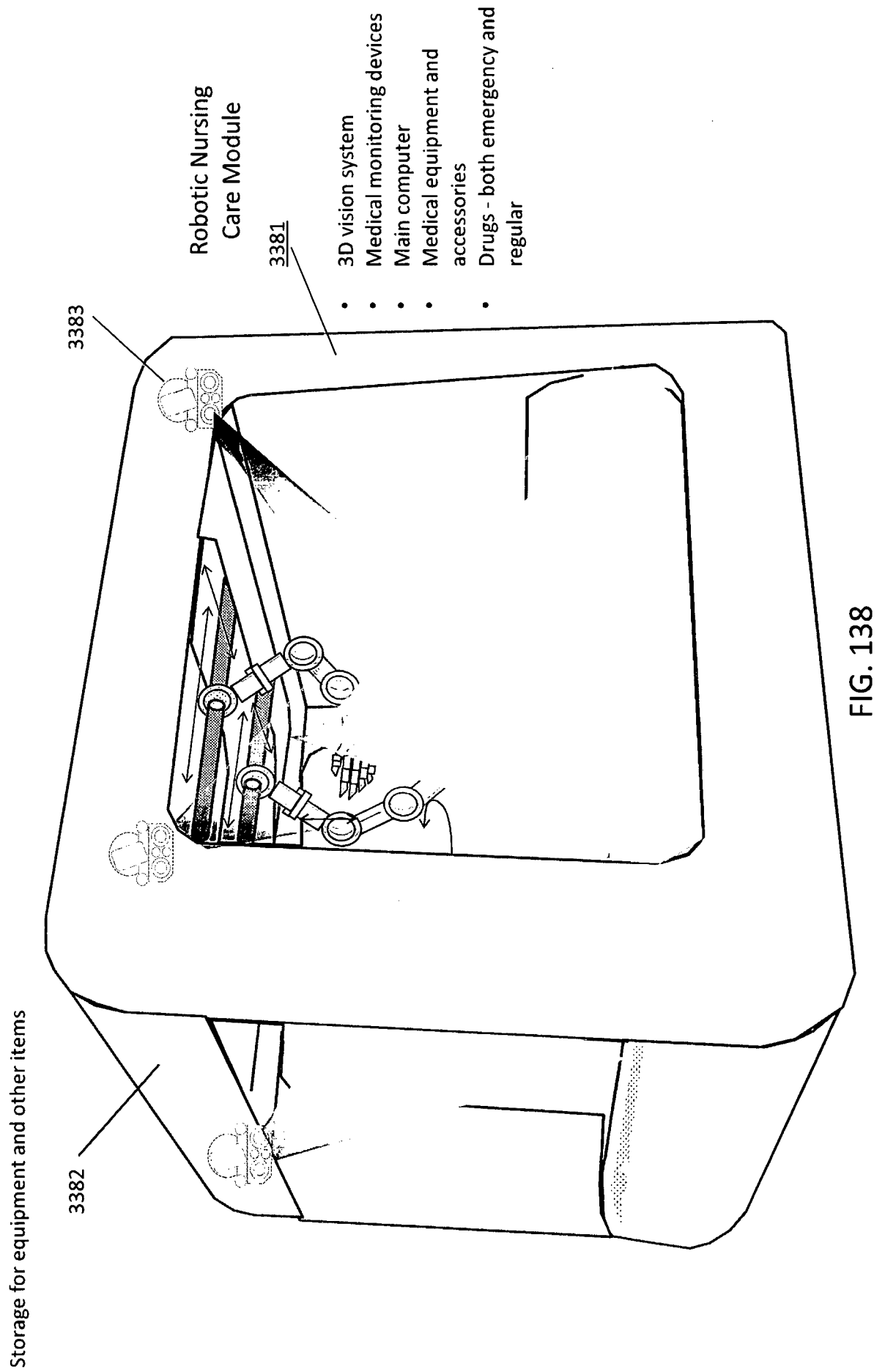
General function result and minimanipulation library example: Moving by walking from A-position to B-position –based on natural human walking



minimanipulation and parameters: the stride (change to the other leg) 3375

pre-defined parameter						
time	right			left		
	Leg	Knee	Foot	Leg	Knee	Foot
Starting and ending	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground	-XYZ initial and target position -Height of leg raising depends of any barriers on the way -Type of stepping technique	-XYZ initial and target position -angle of bending	-XYZ initial and target position -distance to ground
	others					-body: location of center gravity -Joints: vectors at the joints during walking and ground reaction

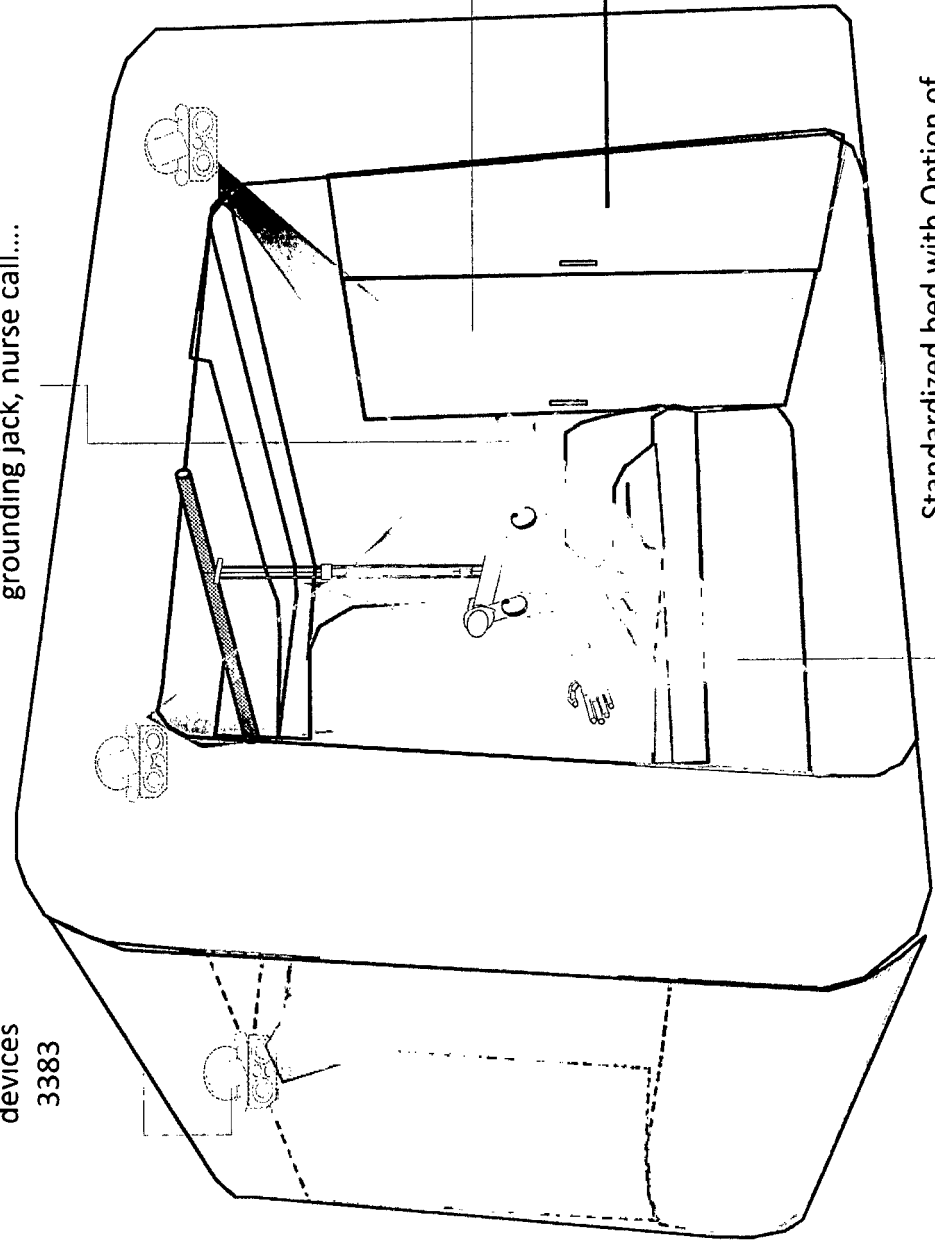
FIG. 137



Nursing care suite module 3381 – front view
can be operated by robot arms/hands or manually

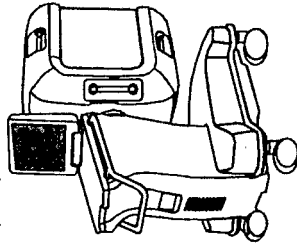
3D vision system
Medical
monitoring
devices
3383

Headboard console 3392 with medical gas outlet,
direct, indirect, nightlight, switches, electric sockets,
grounding jack, nurse call....



Standardized bed with Option of
different bed sizes

Standardized cabinet 3391 to store
standardized mobile medical cart
with computer and built-in imaging
equipment, can be replace by other
standardized lab or emergency
preparation cart



Standardized cabinet to store
standardized electric wheelchair

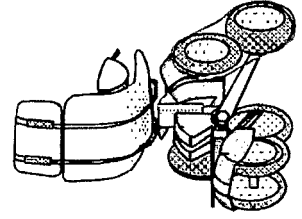


FIG. 139

3381

Nursing care suite module – back view
can be operated by robot arms/hands or manually

Installation of railing system 3401
for robot arms/hands moving and
storage/charging dock for robot
arms/hands when in manual mode

Standardized storage and
organizer 3402
of Medicine, medical
accessory

Standardized screen 3403
can split to multiple
screens for integrated
monitoring/tracking,
Internet, and TV

Standardized
wardrobe
3404

3405
Optional bathroom module,
kitchenette module (e.g. for
residential use)

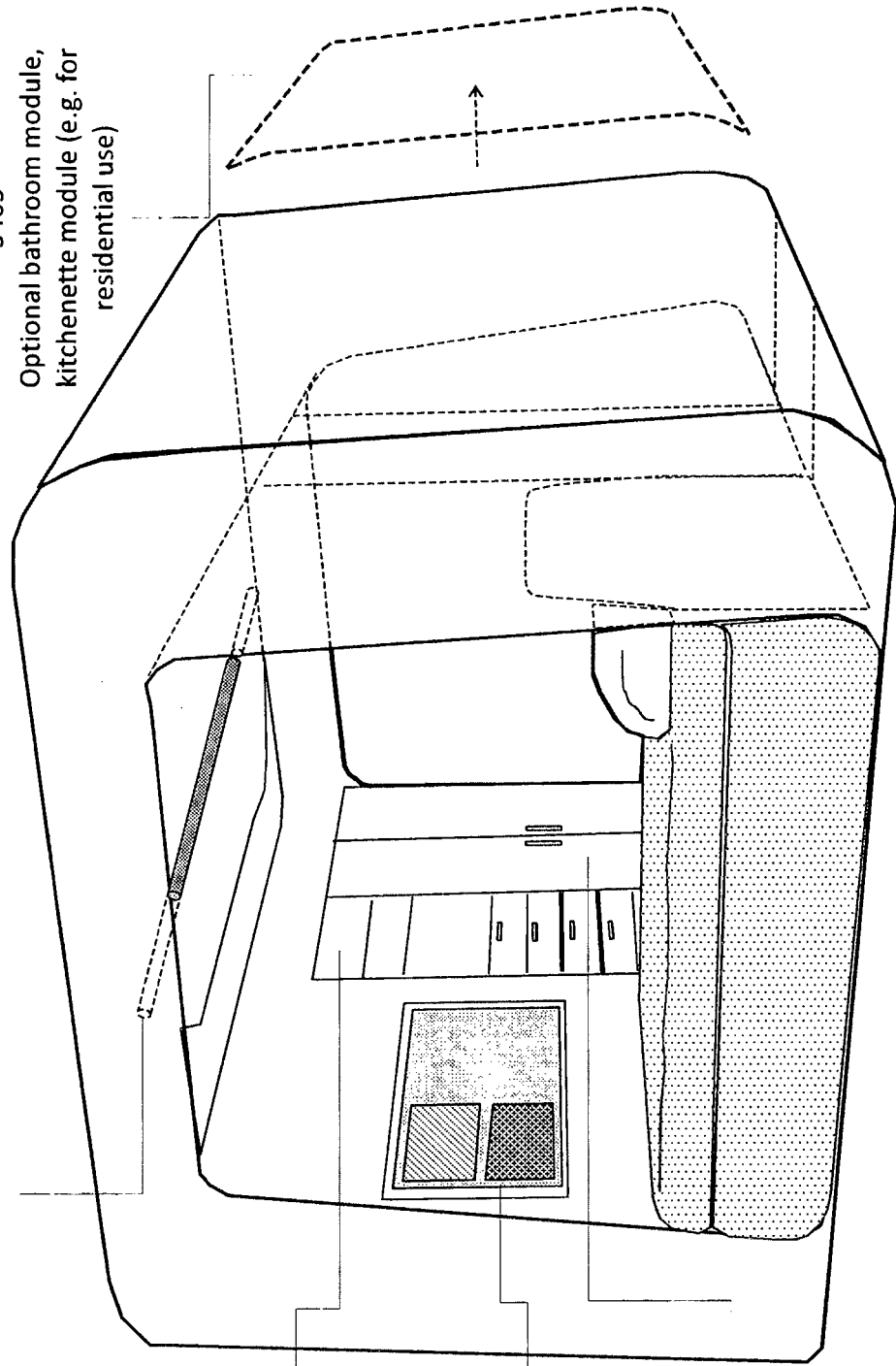


FIG. 140

3381

Nursing care suite module – robot arms/hands operating

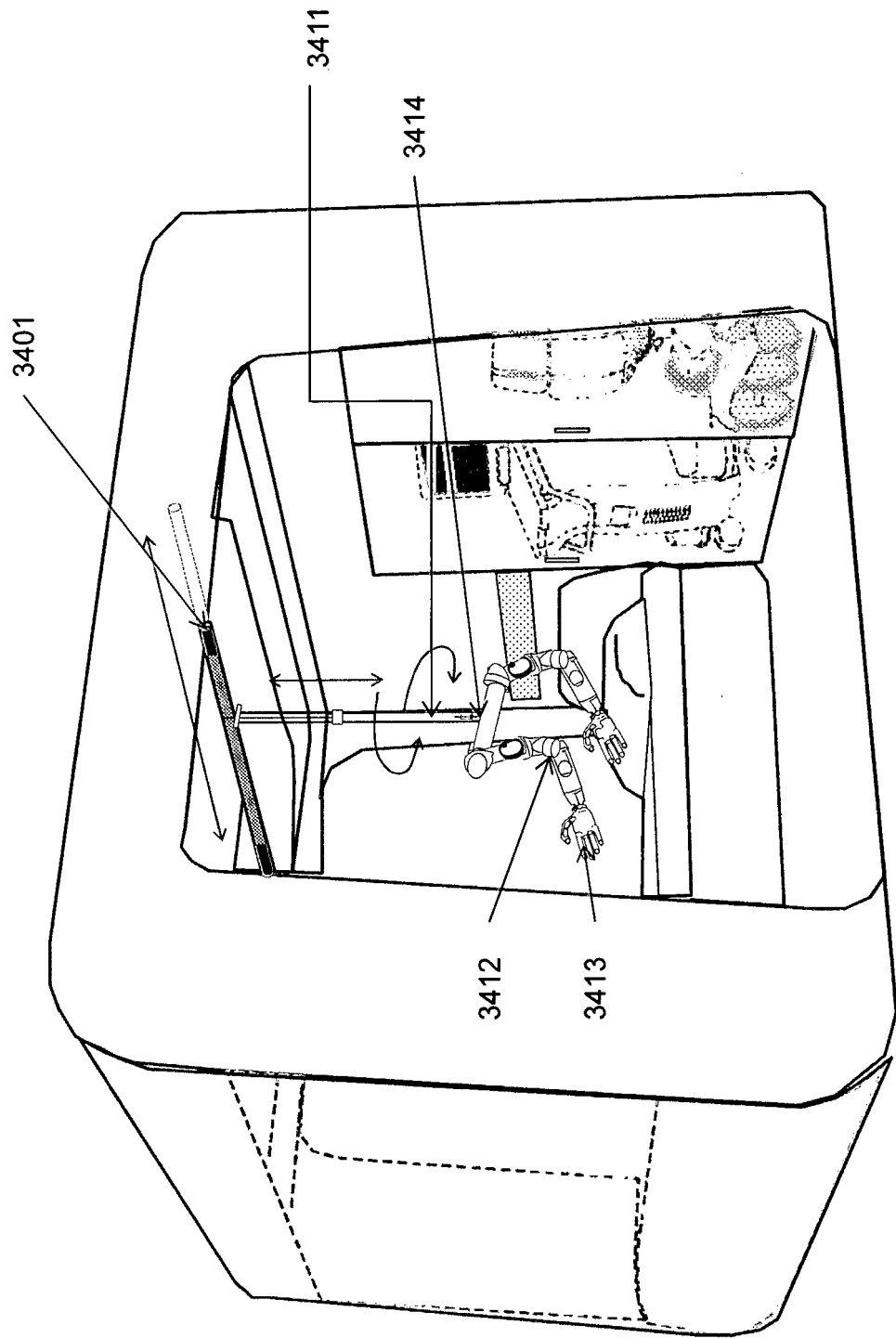


FIG. 141

Task Execution example 1 – helping patient/senior taking medicine

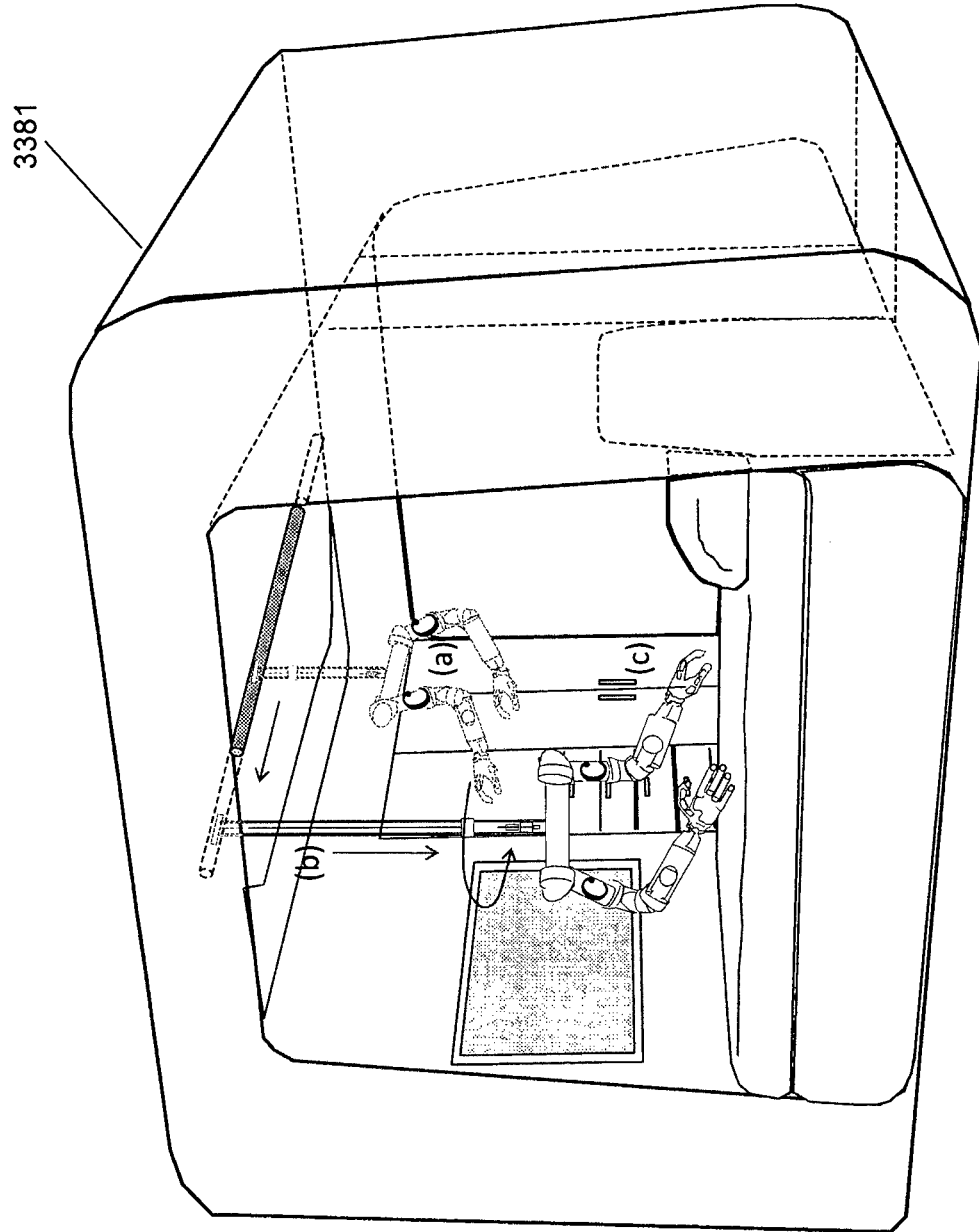


FIG. 142

Task Execution example 2 – helping patient/senior moving

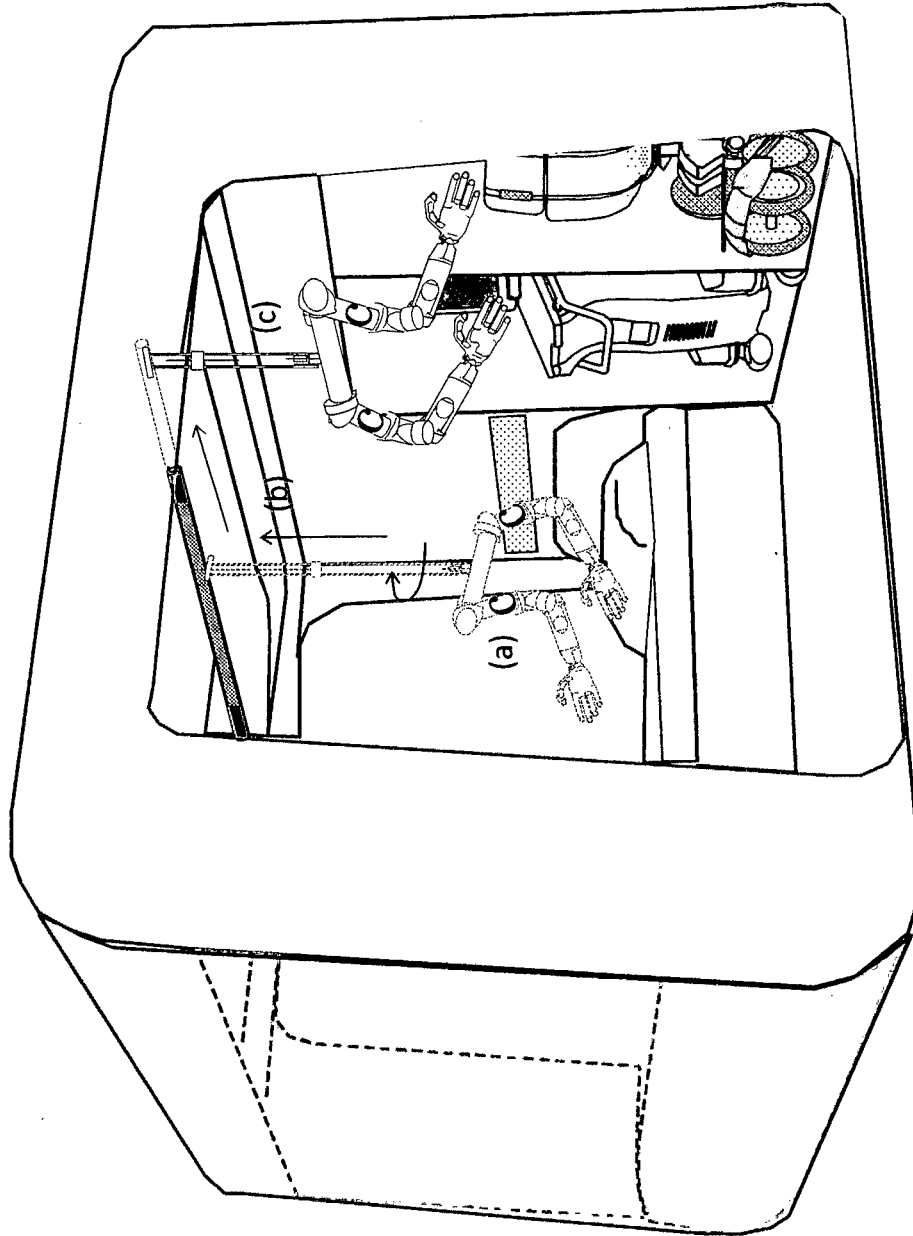


FIG. 143

A humanoid robot serves as a facilitator from communicating from person A to person B
 Example: telepresence application (real-time emulation)

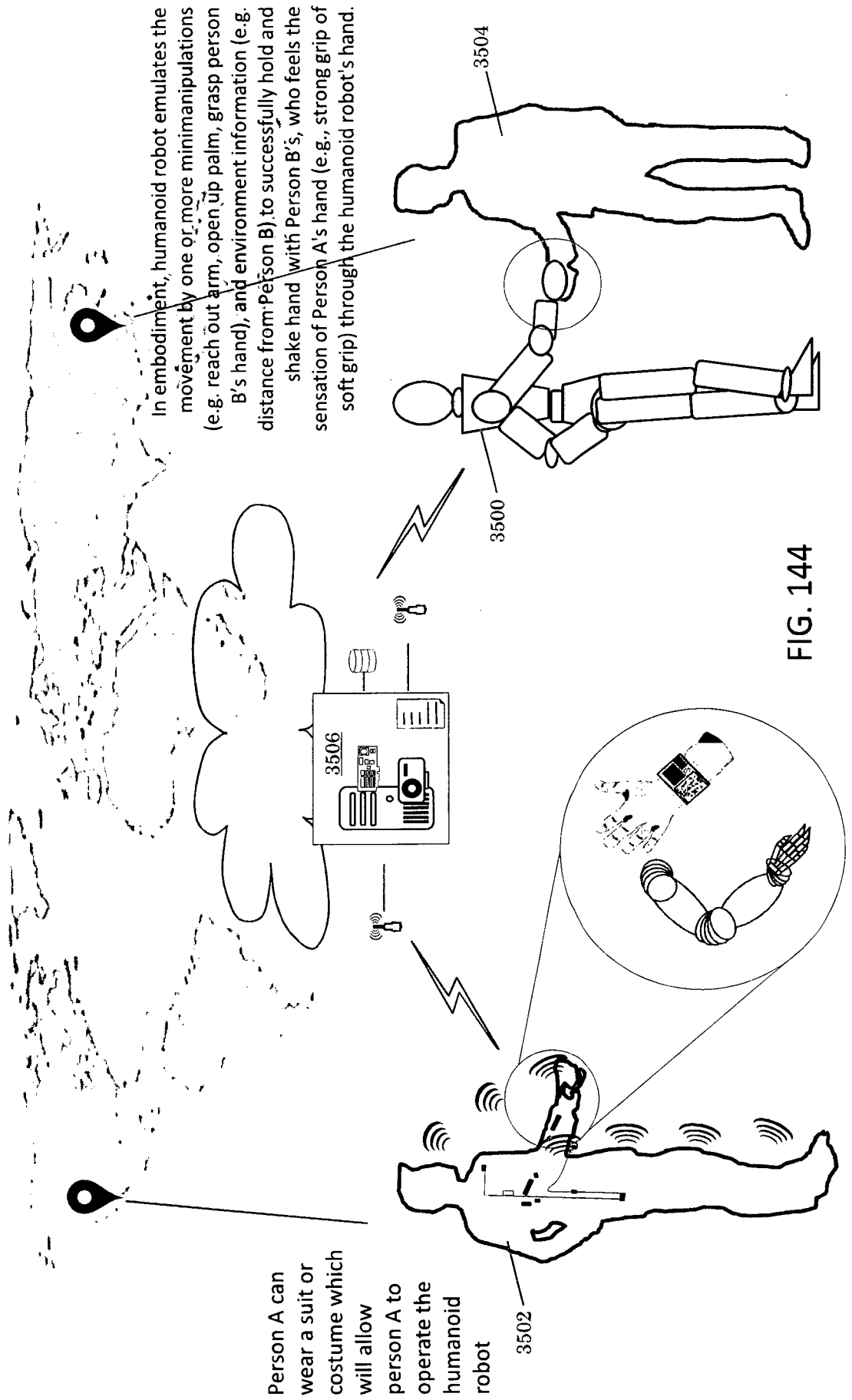


FIG. 144

A humanoid robot serves as a facilitator from communicating from person A to person B
 Example: nursing care or therapy application (preloaded program – similar to the cooking robot concept)

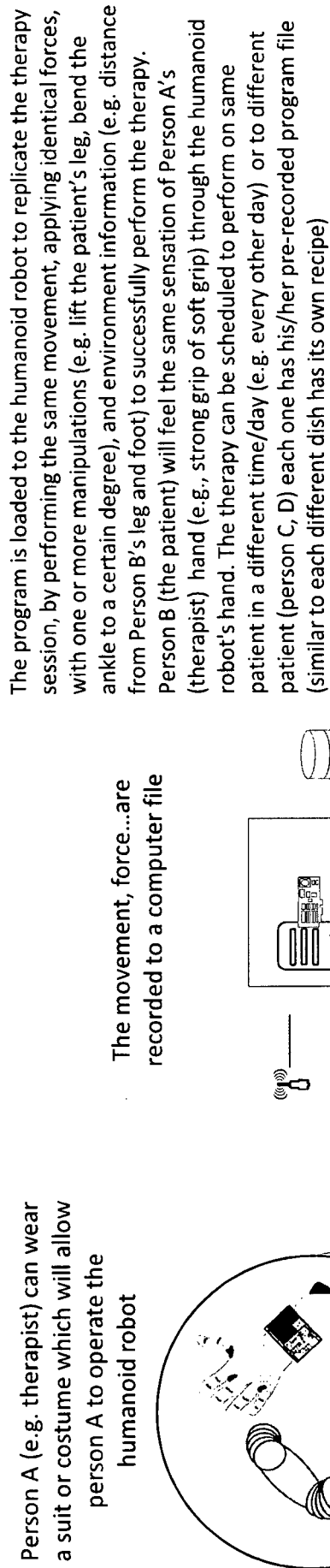
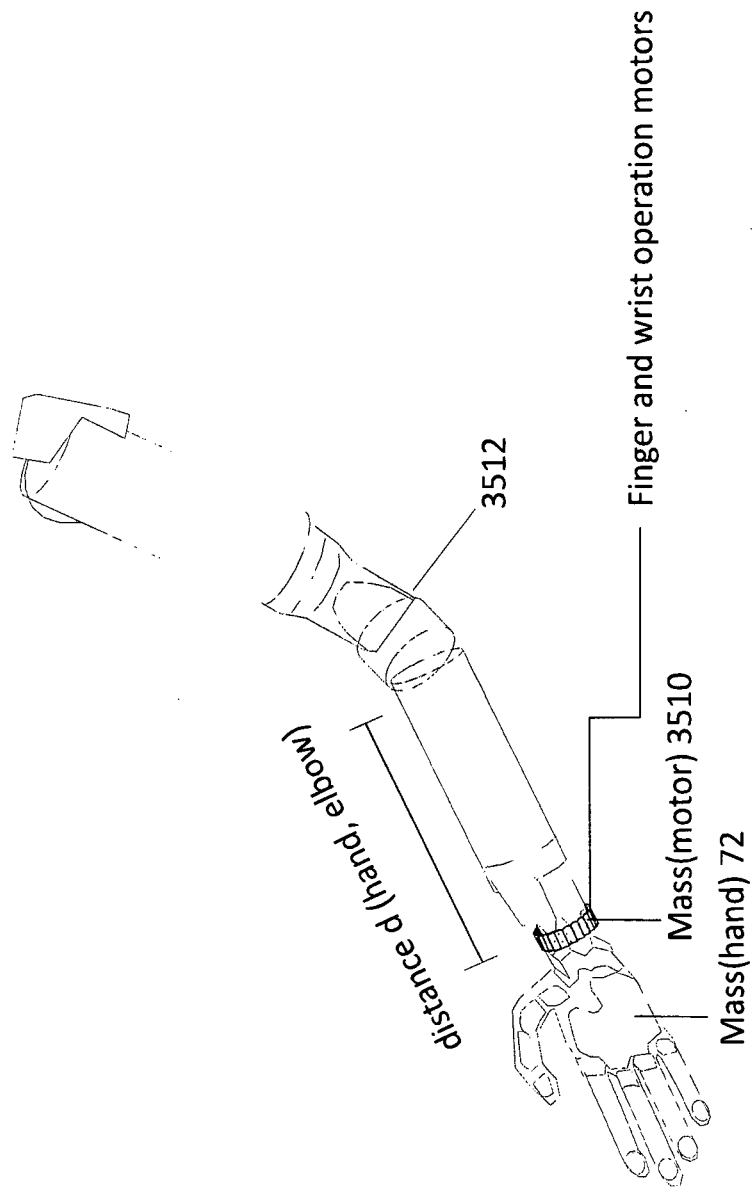


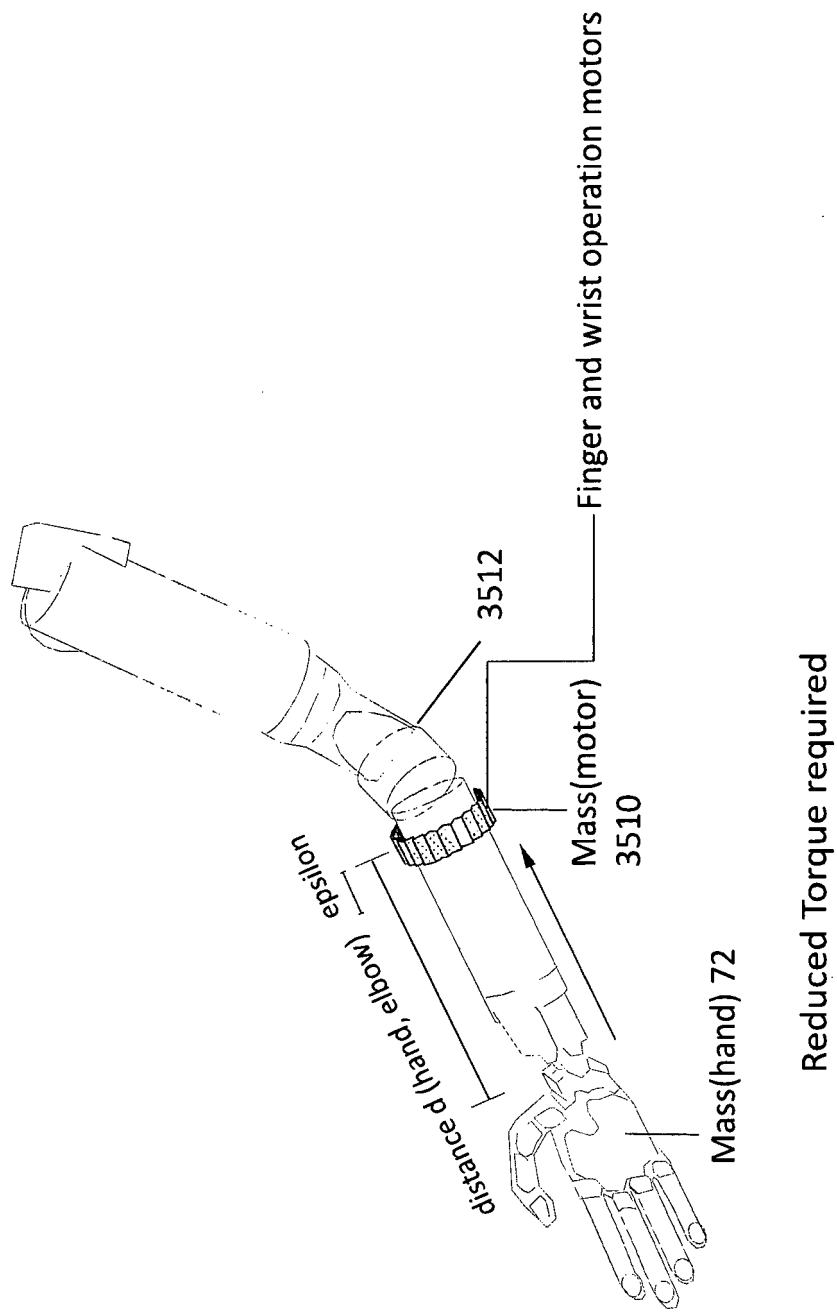
FIG. 145



Full torque required to move arm

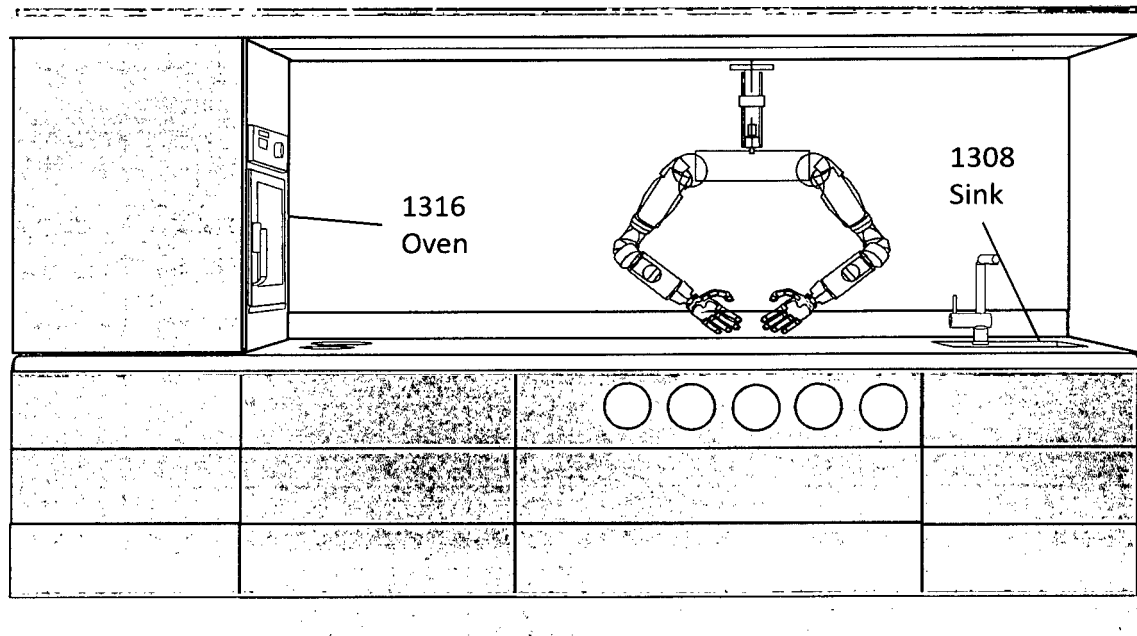
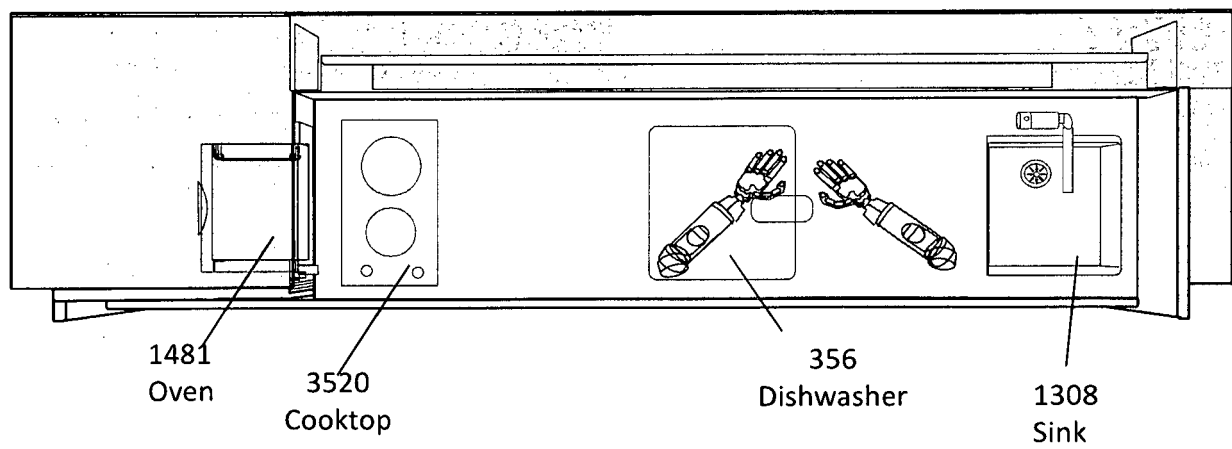
$$\text{Case 1: } T_{\text{original}}(\text{hand}) = (w_{\text{hand}} + w_{\text{motor}})d_h(\text{hand, elbow})$$

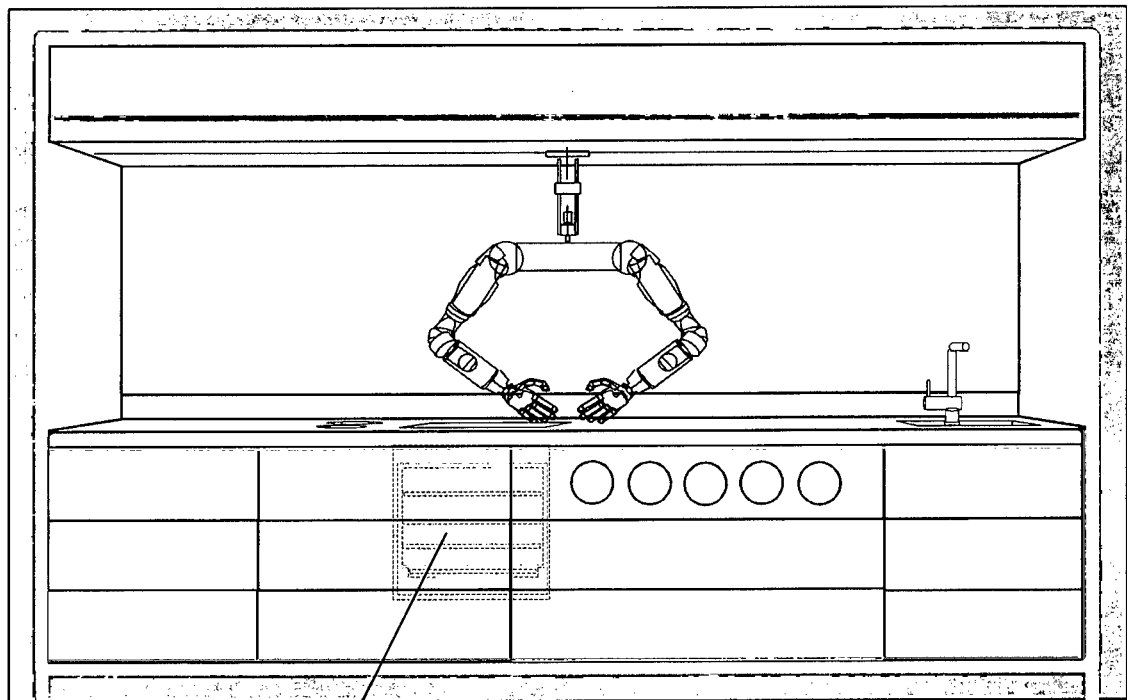
FIG. 146



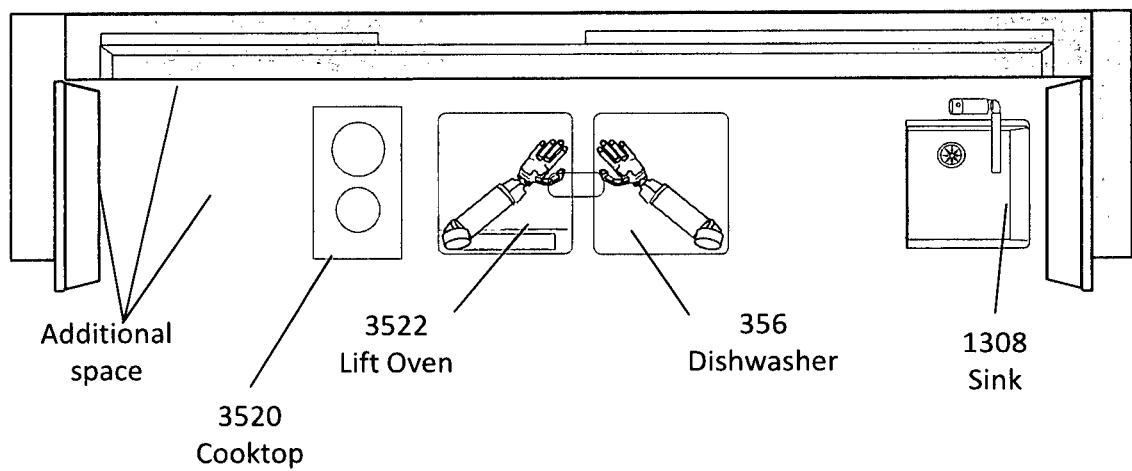
Case 2: $T_{new}(hand) = (w_{hand})d_h(hand, elbow) + (w_{motor})\epsilon_h + \frac{1}{2}w_{axel}d_h(hand, elbow)$

FIG. 147

front view**FIG. 148A**top view**FIG. 148B**

front view

3522
Lift Oven

FIG. 149Atop view

Additional
space

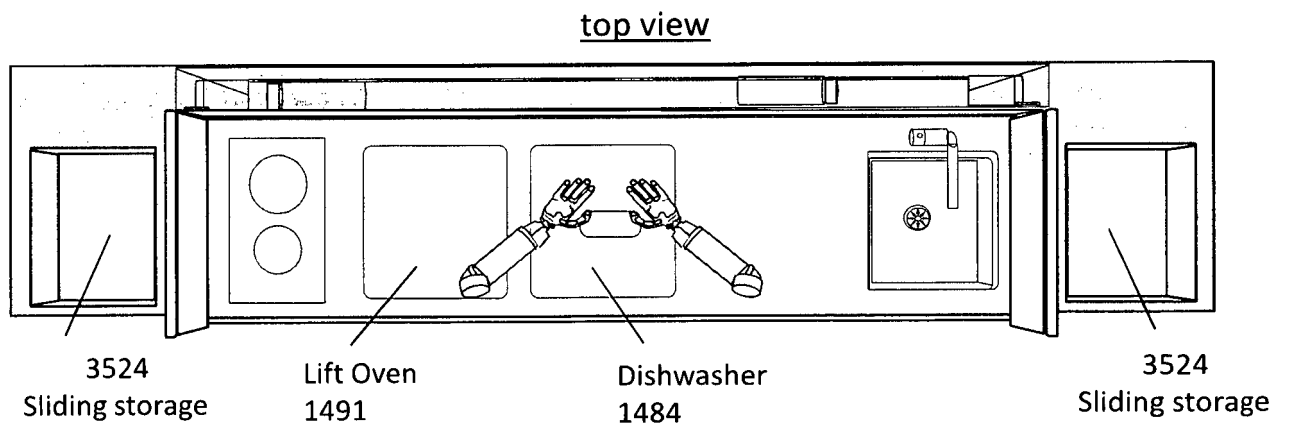
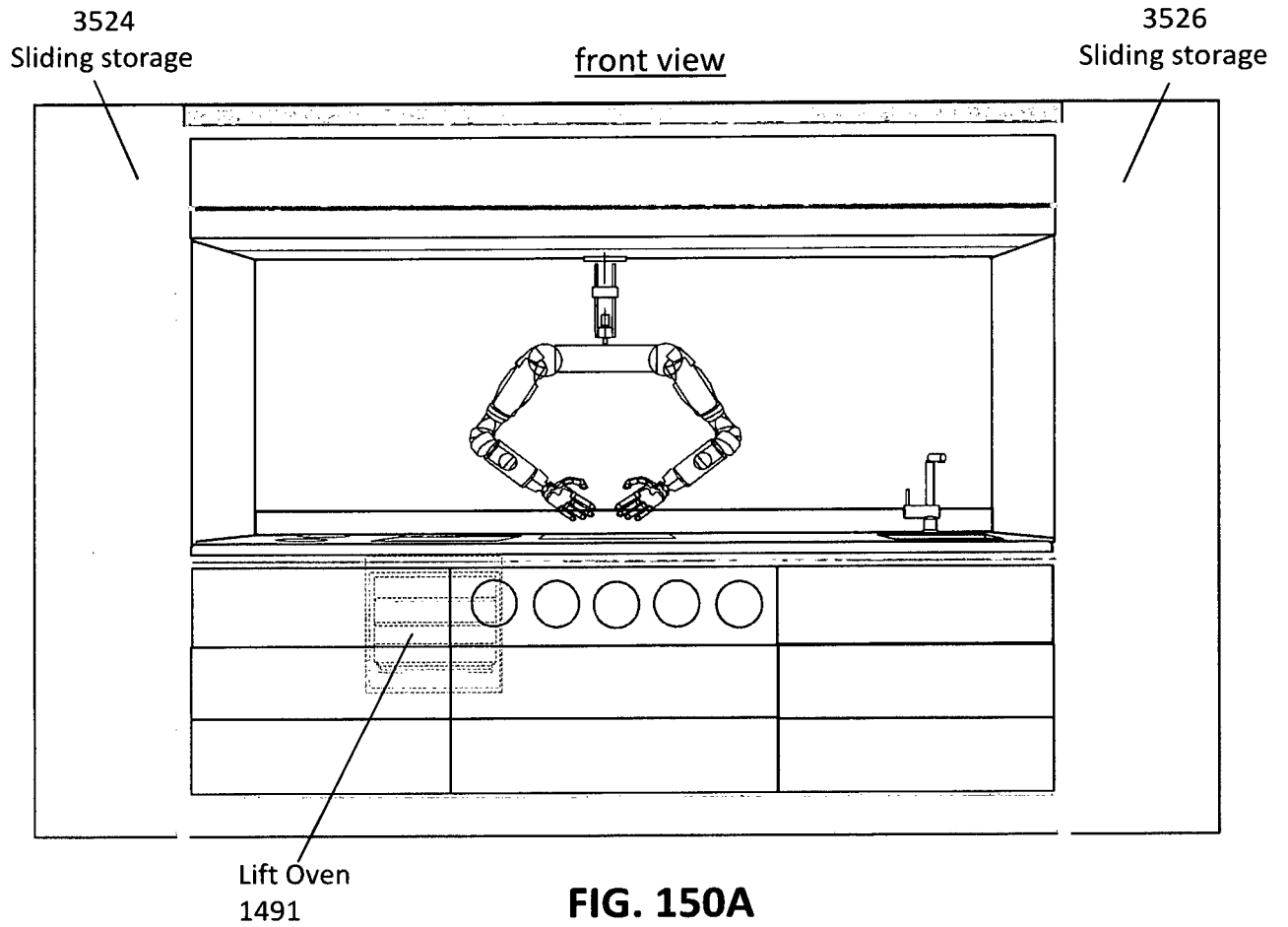
3520
Cooktop

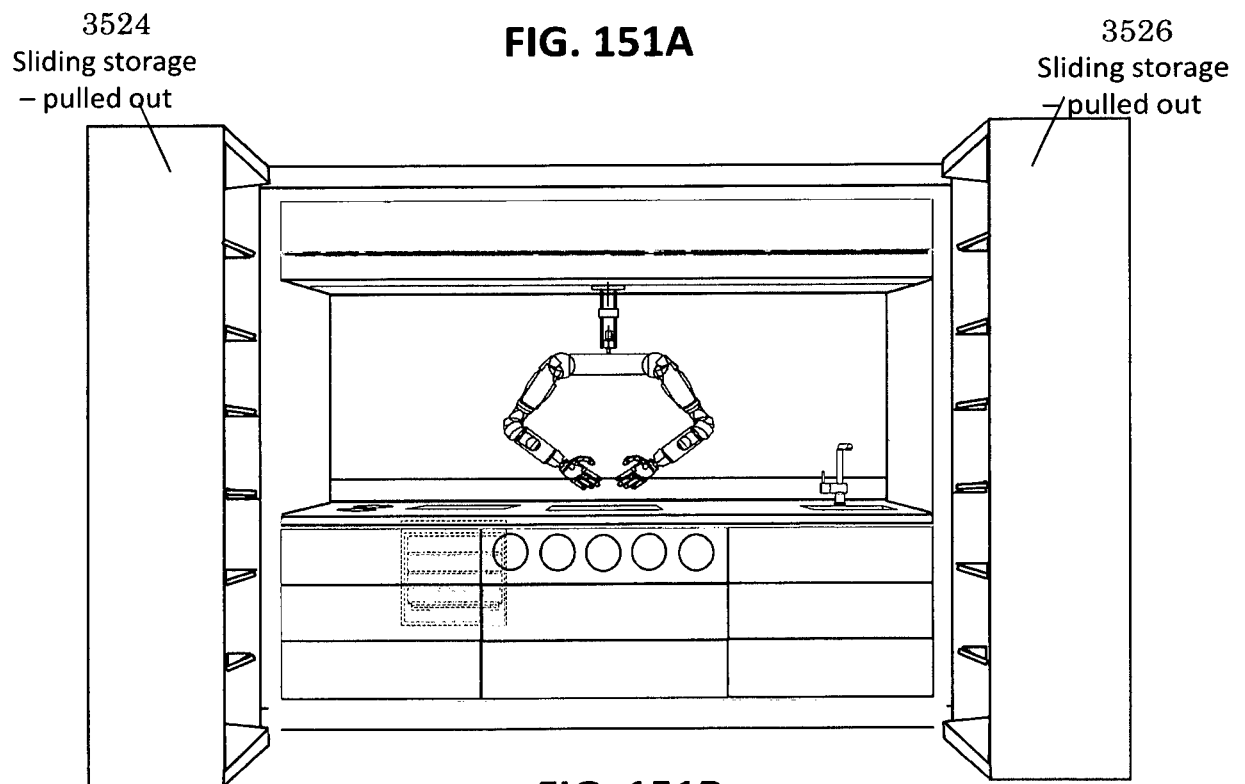
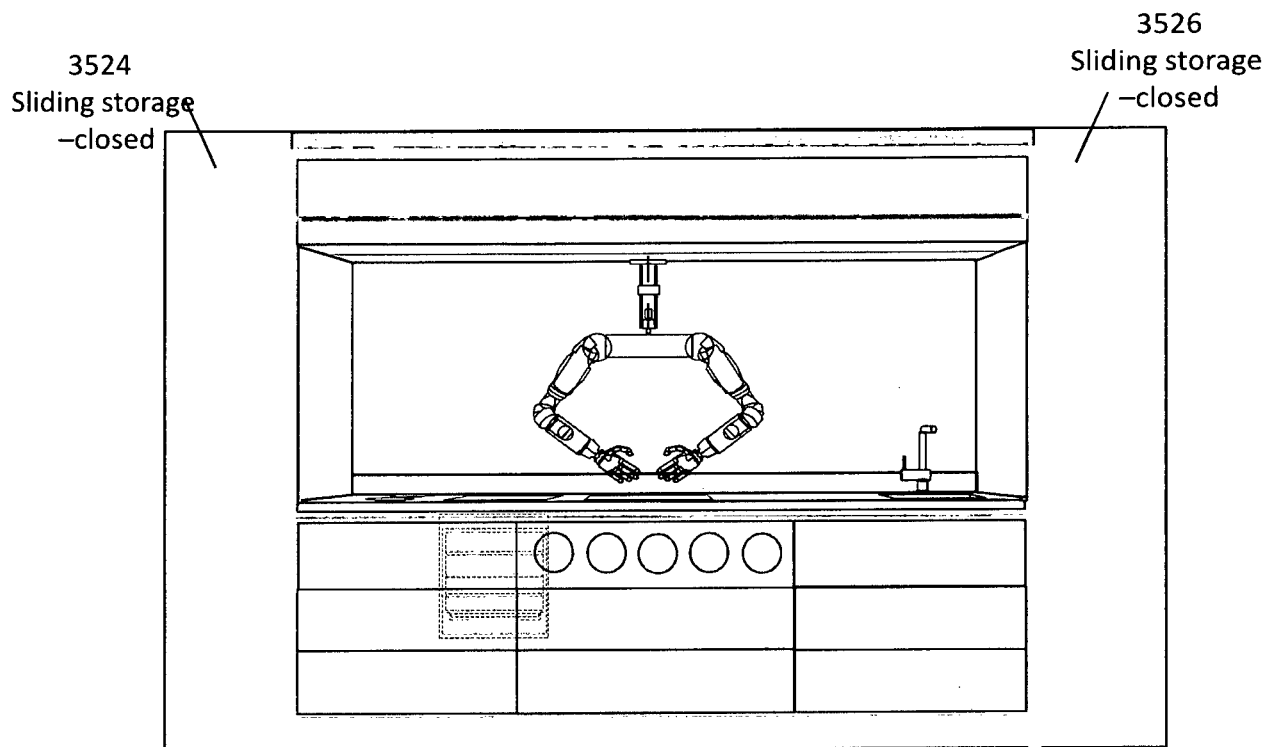
3522
Lift Oven

356
Dishwasher

1308
Sink

FIG. 149B





First explosions
Step grip | steady | plasticine, card, and foam
1. First test

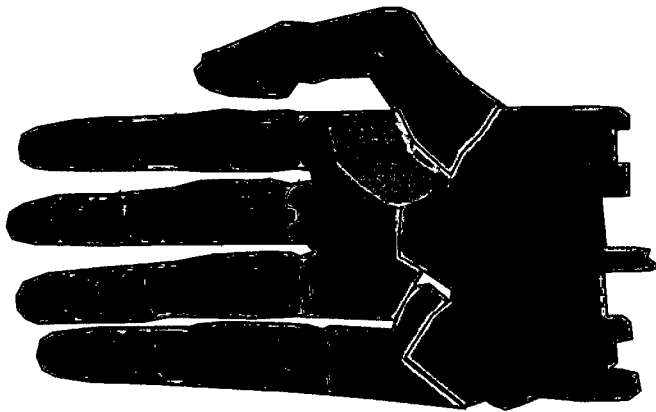
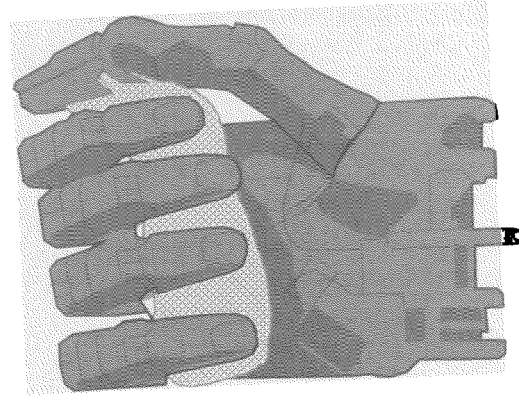
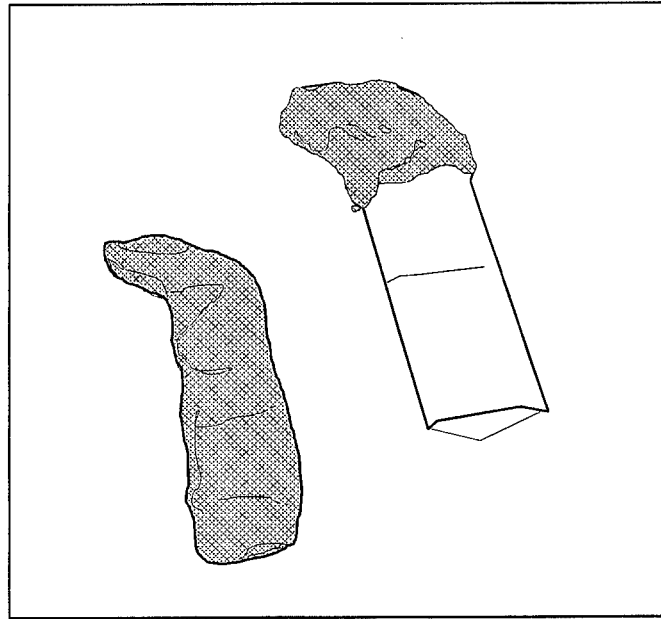


FIG. 152

First explosions
Step grip | steady | plasticine, card, and foam
2.1 knuckle exploration 1/2

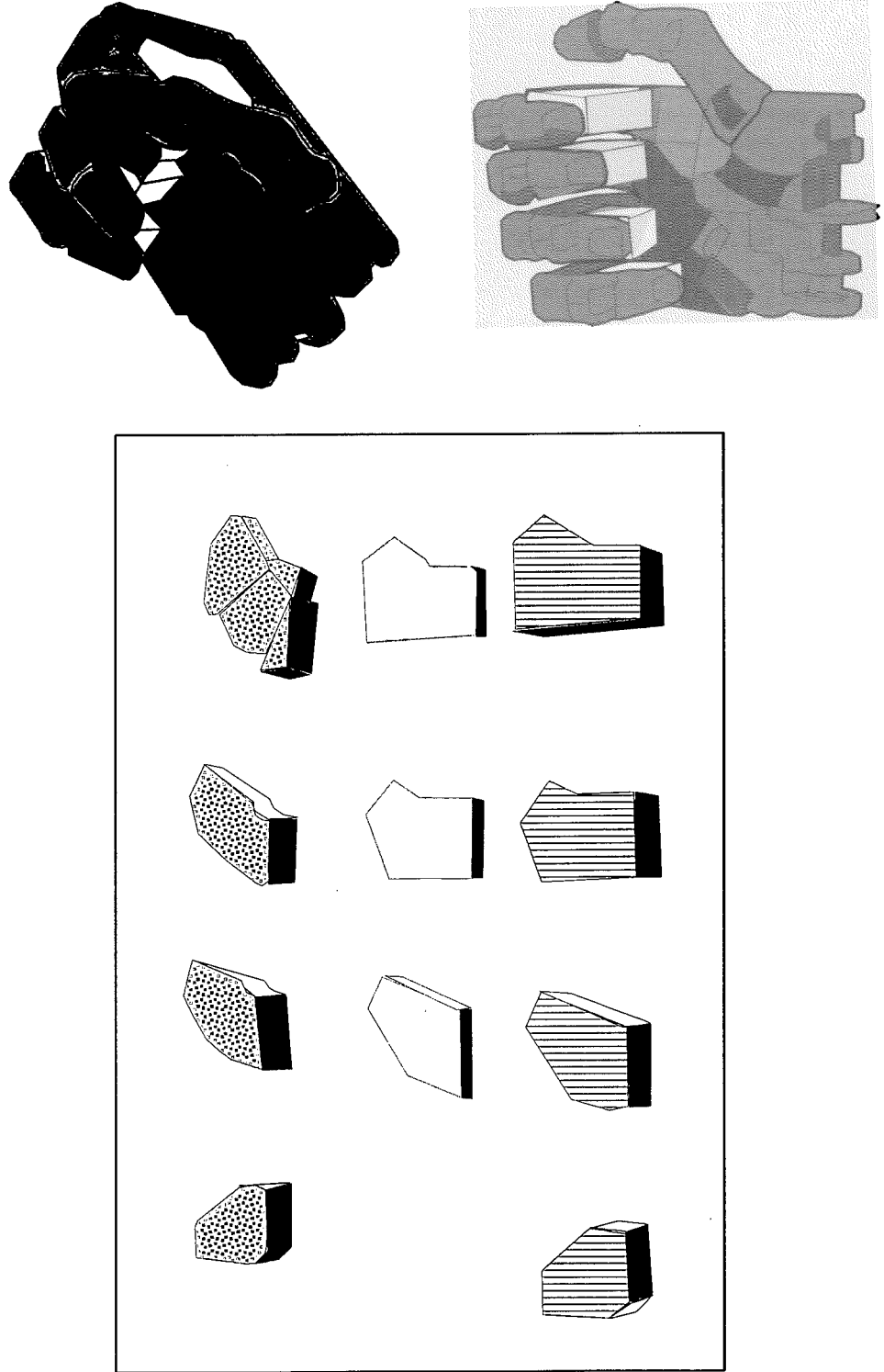


FIG. 153

First explosions
Step grip | steady | plasticine, card, and foam
2.2 knuckle exploration 2/2

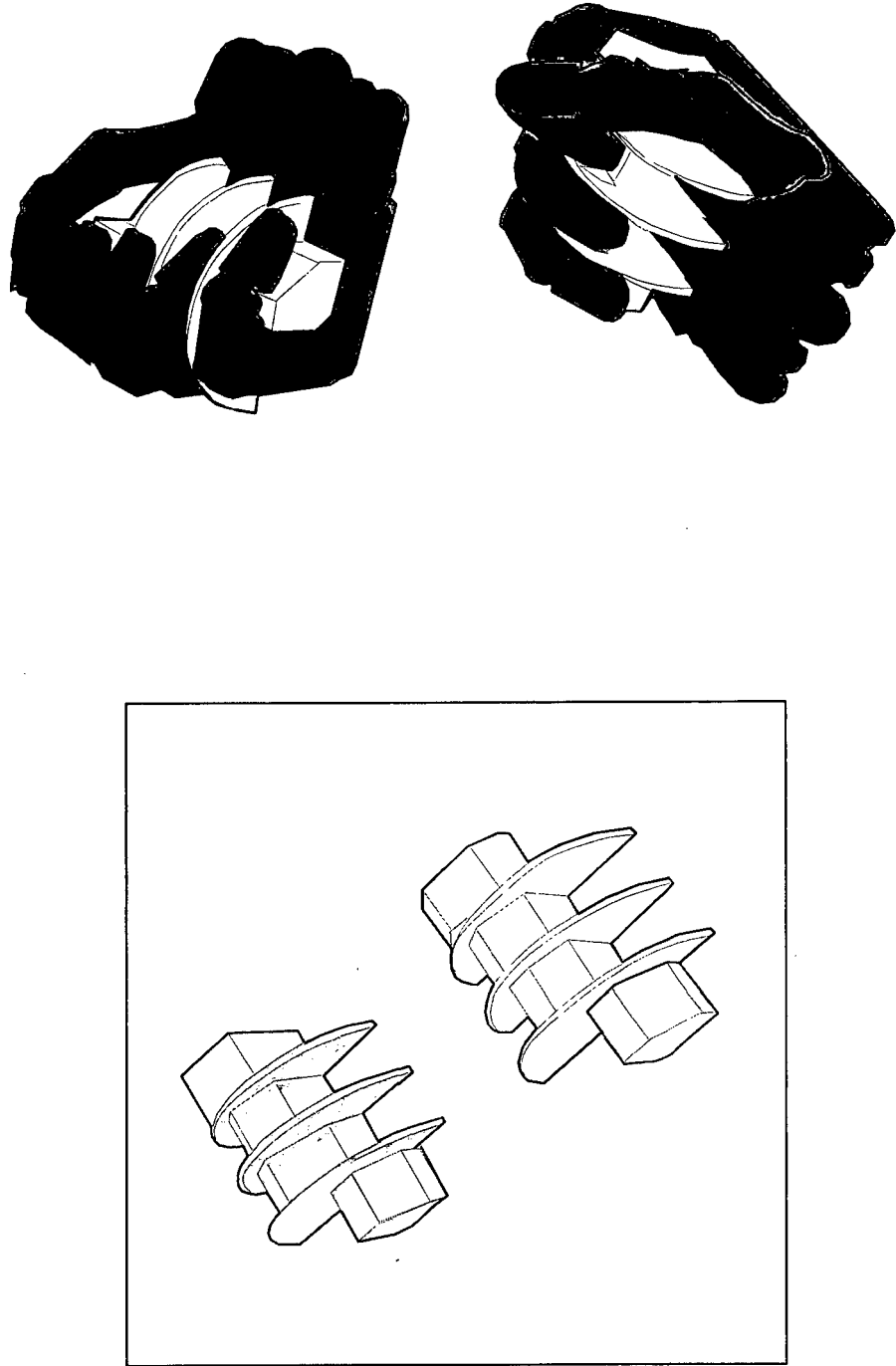


FIG. 154

Final proposal
Adjusted loft | precise and angled | PLA
3. Step grip exploration

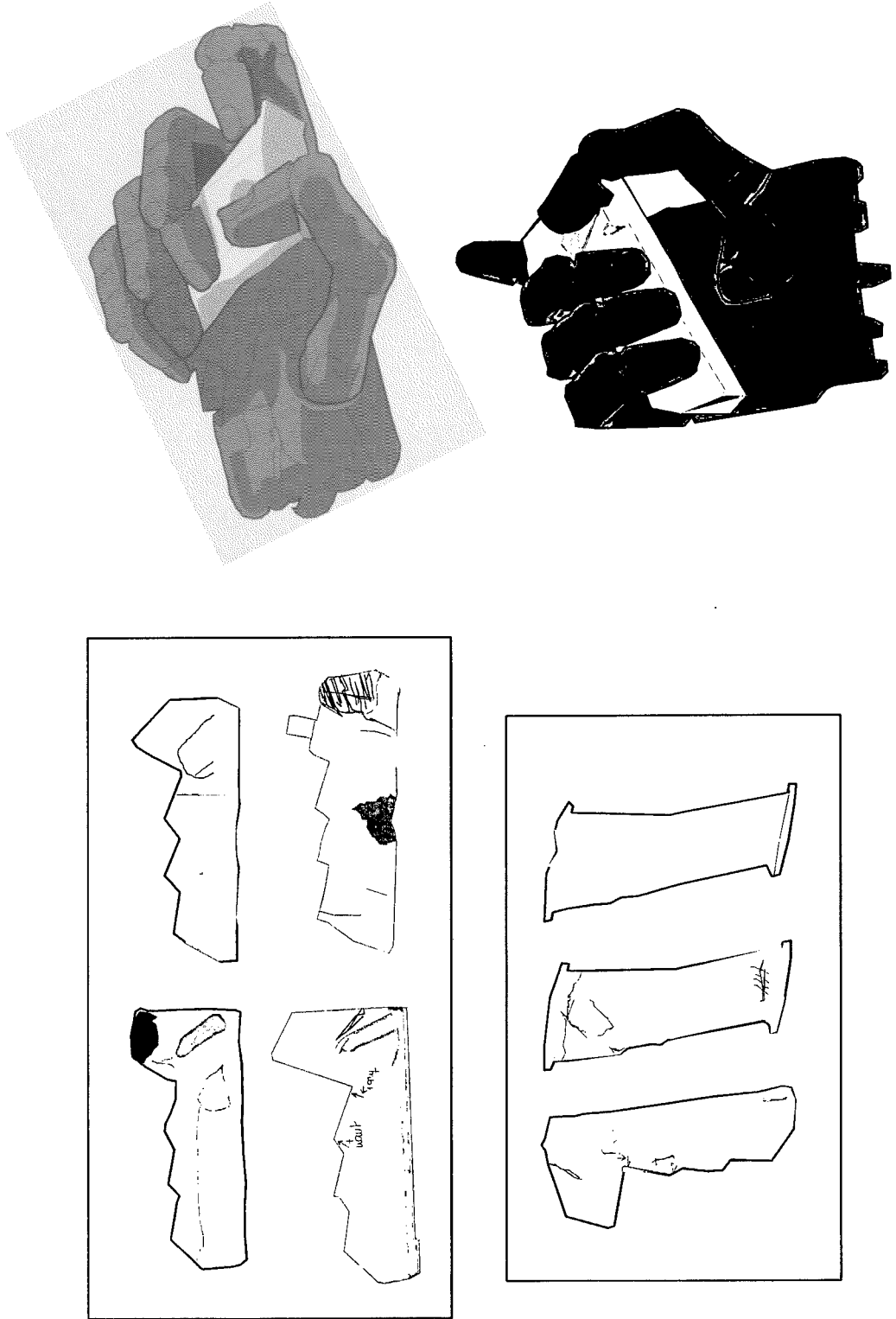


FIG. 155

Loft iterations
Flowing grip | steady and curvilinear | PLA
1. Loft iterations

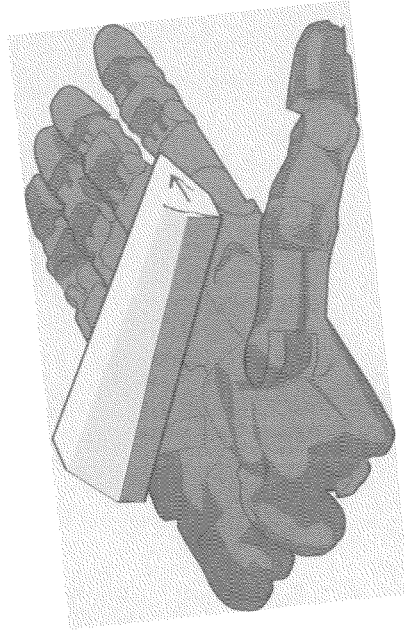
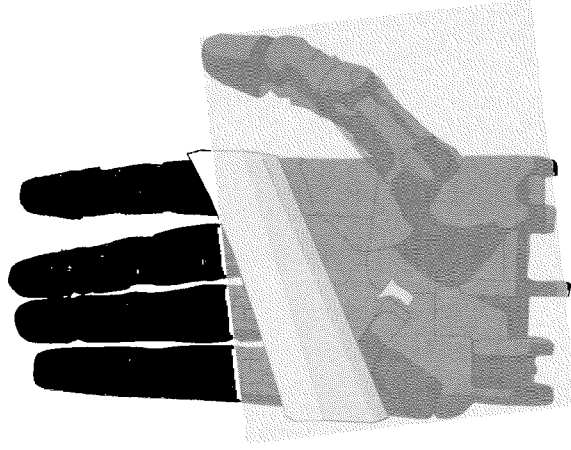
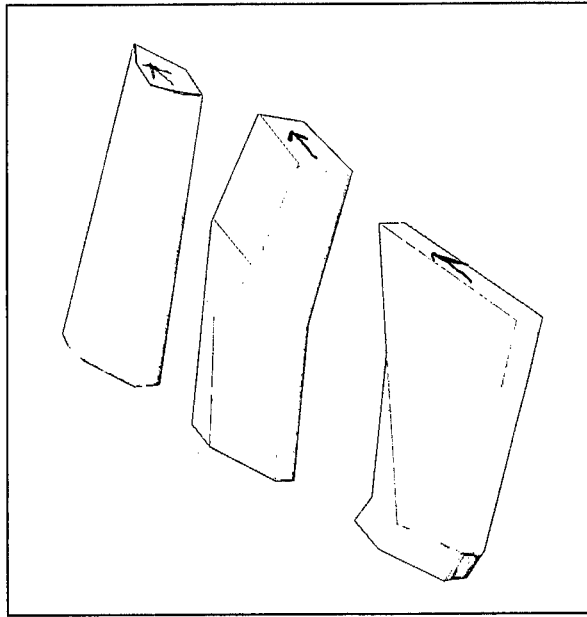


FIG. 156

Loft iterations
Flowing grip | steady and curvilinear | PLA
2.1 taking the loft forward 1/2

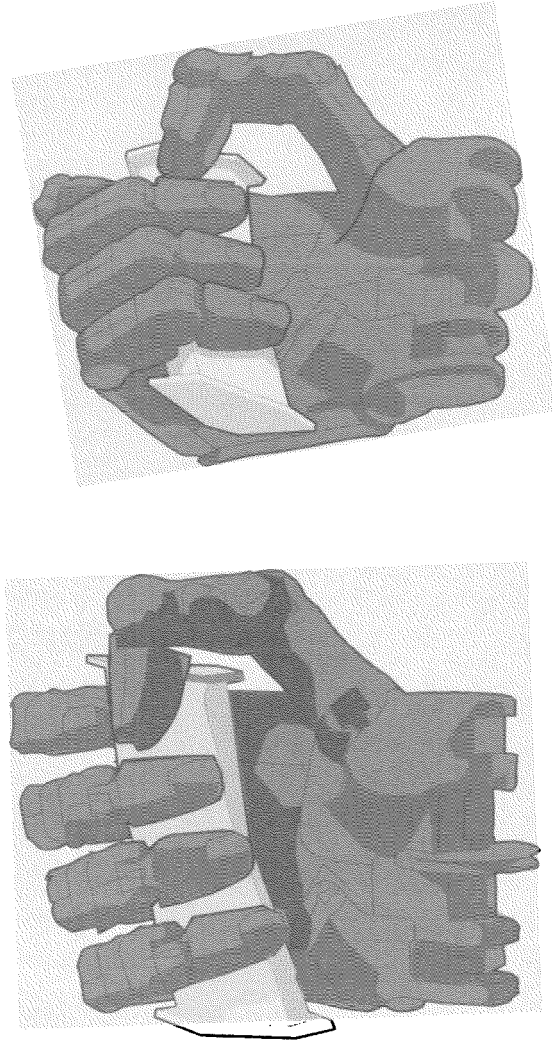
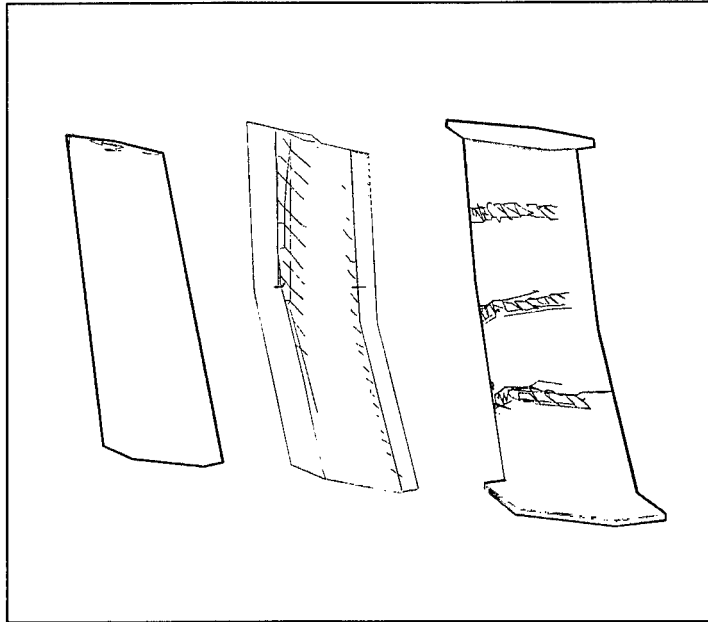


FIG. 157

Loft iterations
Flowing grip| steady and curvilinear | PLA
2.2 taking the loft forward 2/2

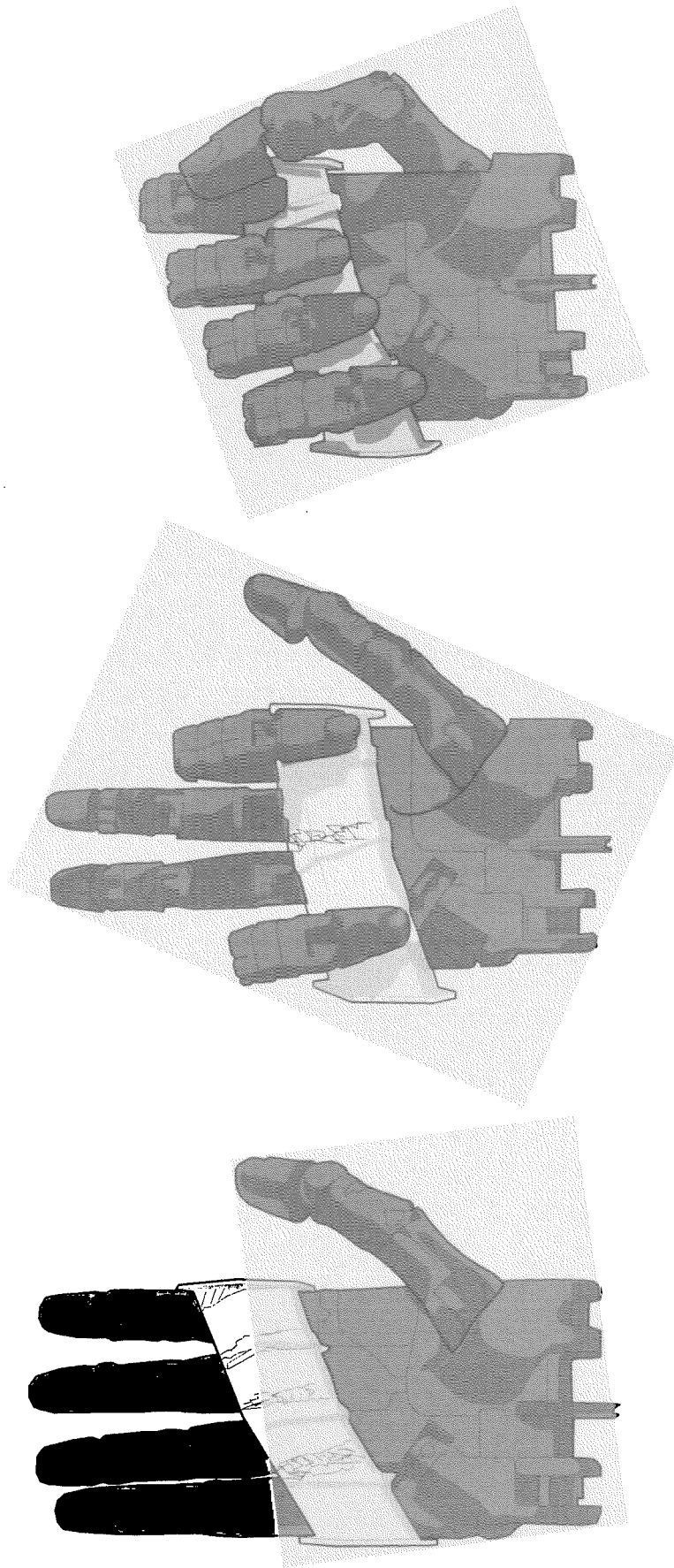


FIG. 158

Loft iterations
Flowing grip | steady and curvilinear | PLA
3 taking the loft forward – iterative process

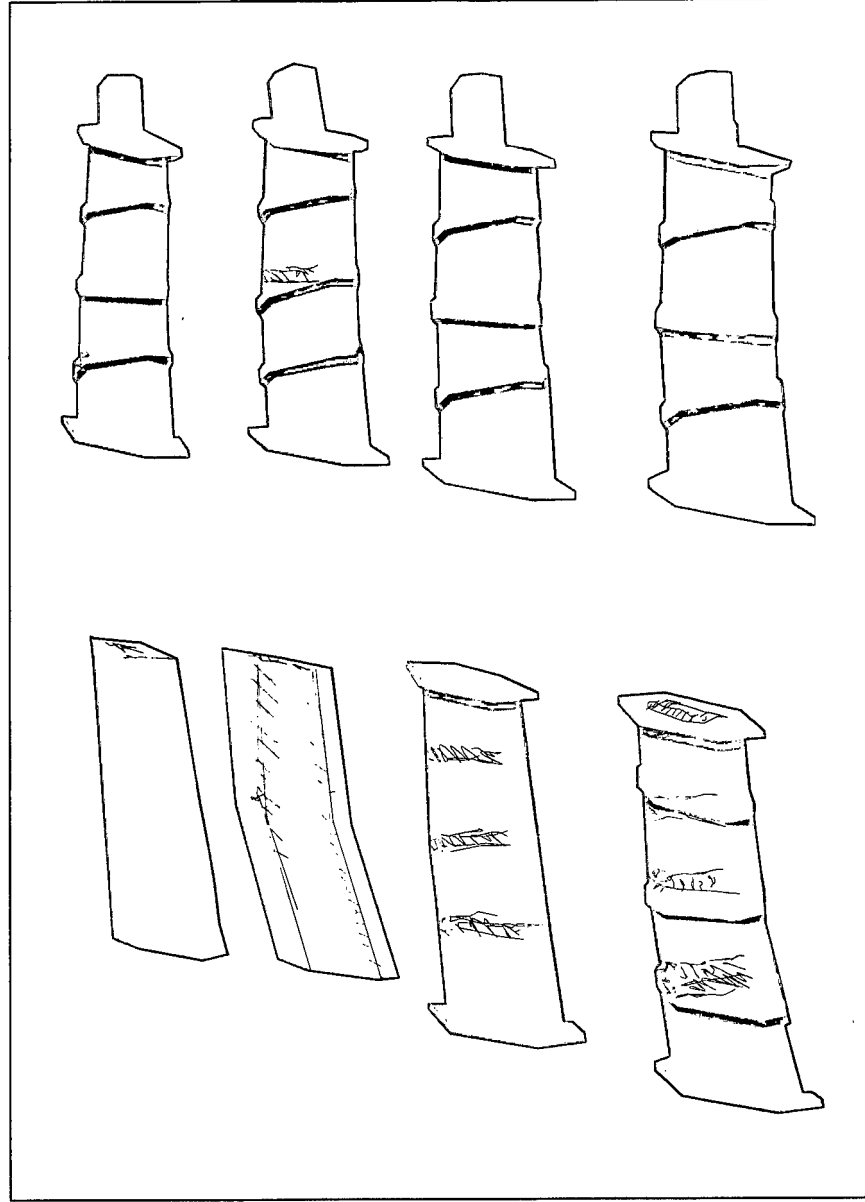


FIG. 159

Final proposal
Adjusted loft | precise and angled | PLA
Final proposal 1/2

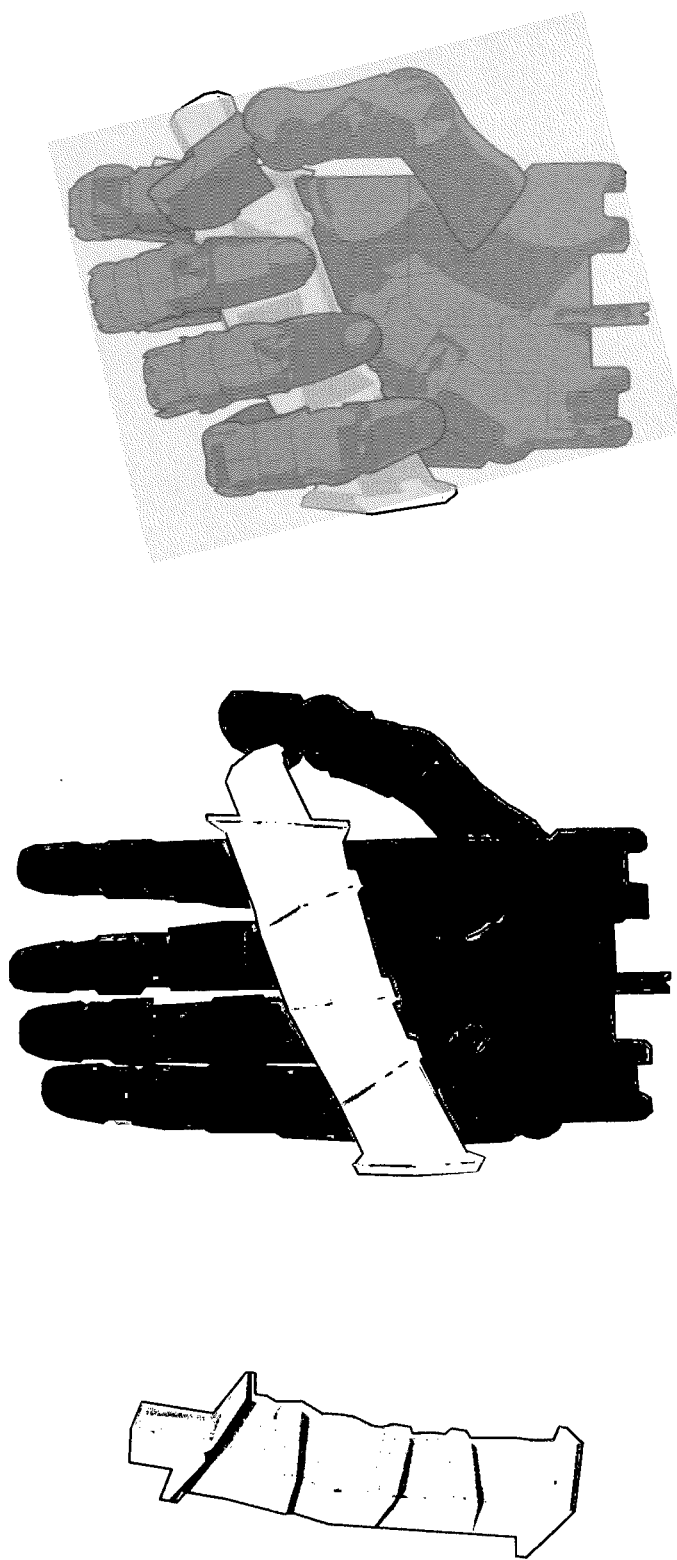


FIG. 160

Final proposal
Adjusted loft | precise and angled | PLA
Final proposal 2/2

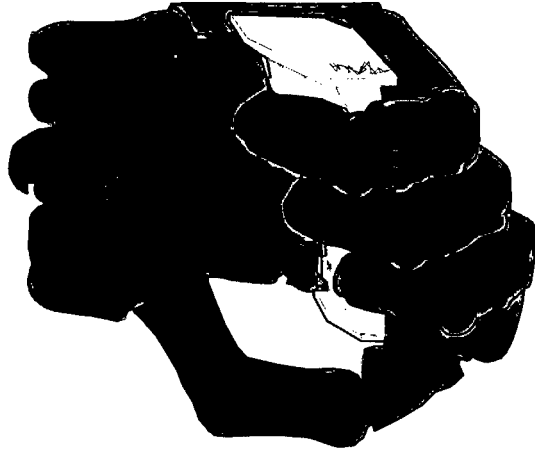
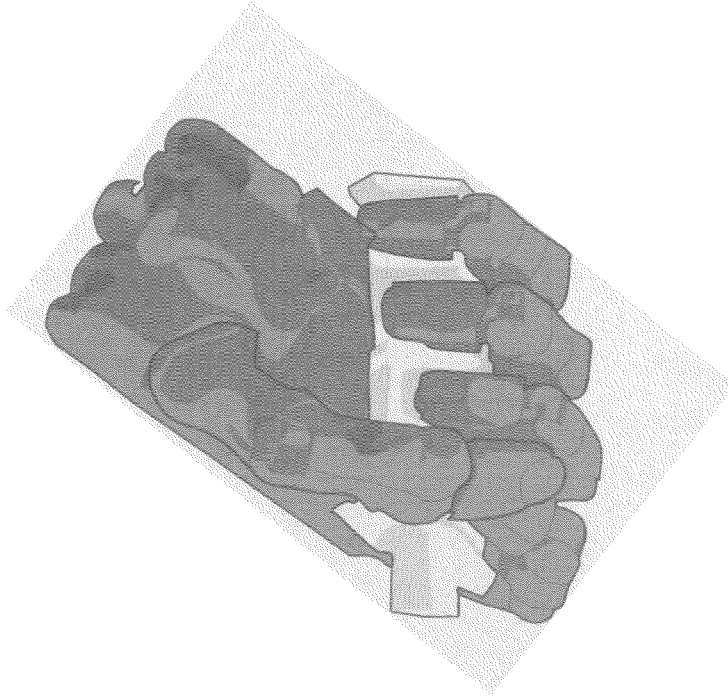


FIG. 161

PALETTE KNIFE

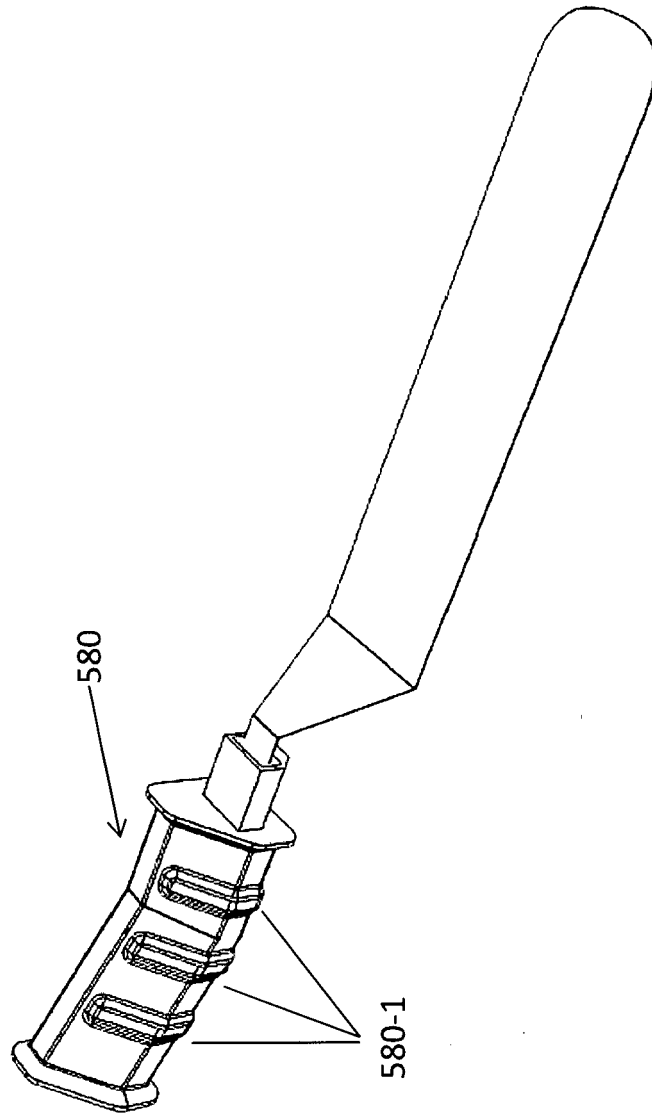


FIG. 162A

SMALL SPATULAR

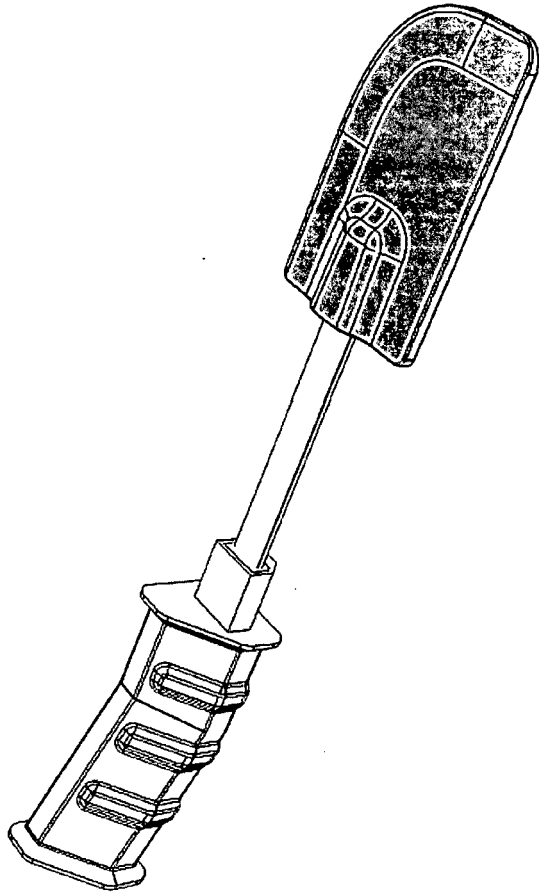


FIG. 162B

FISH SLICE

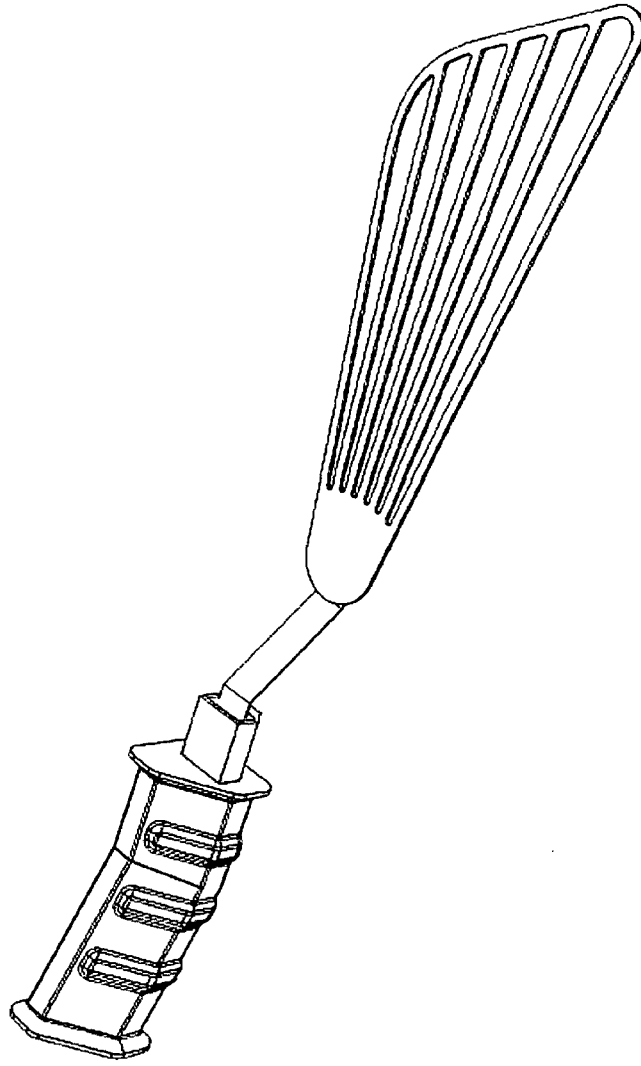


FIG. 162C

WHISK

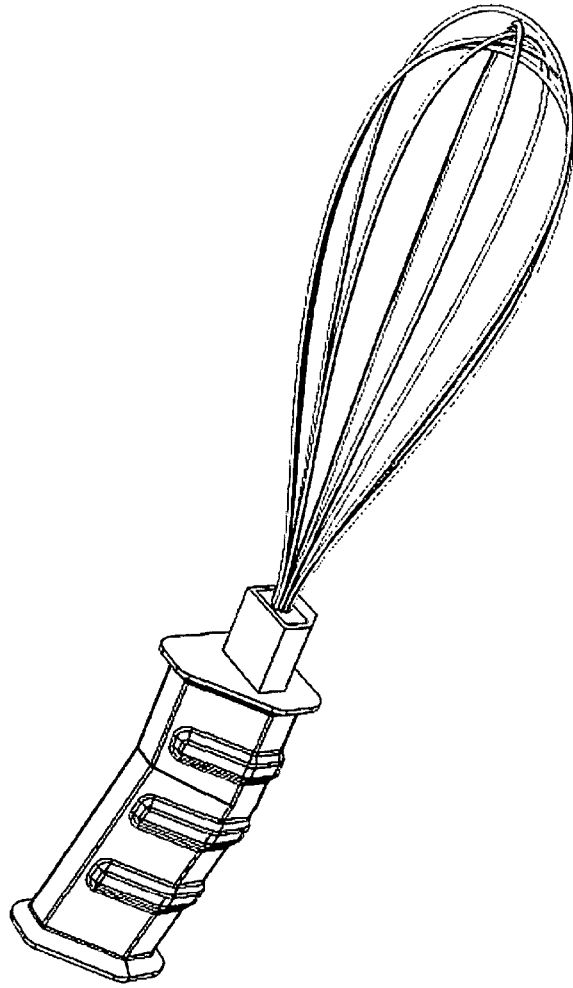


FIG. 162D

LARGE SPATULAR

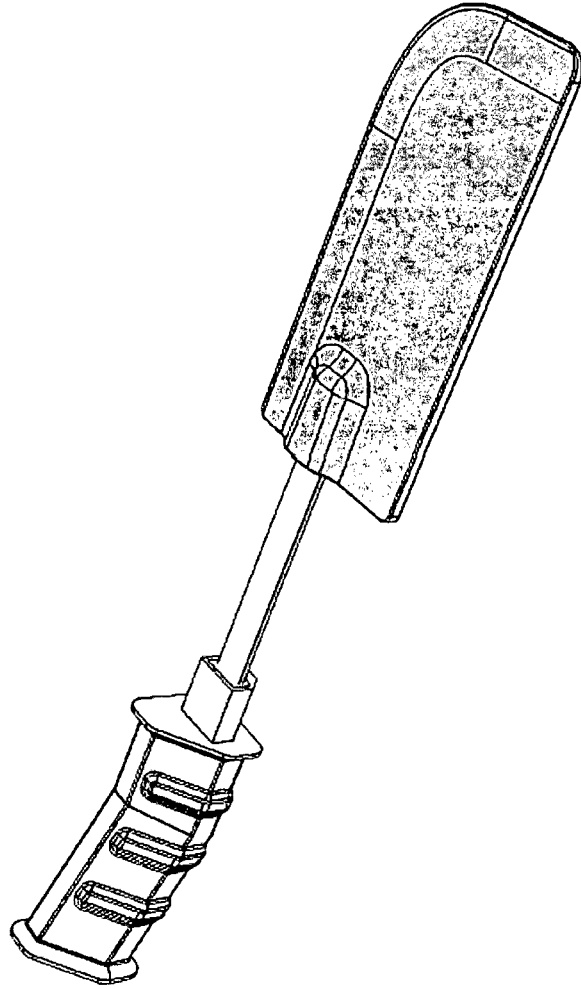


FIG. 162E

SMALL SAUCEPAN

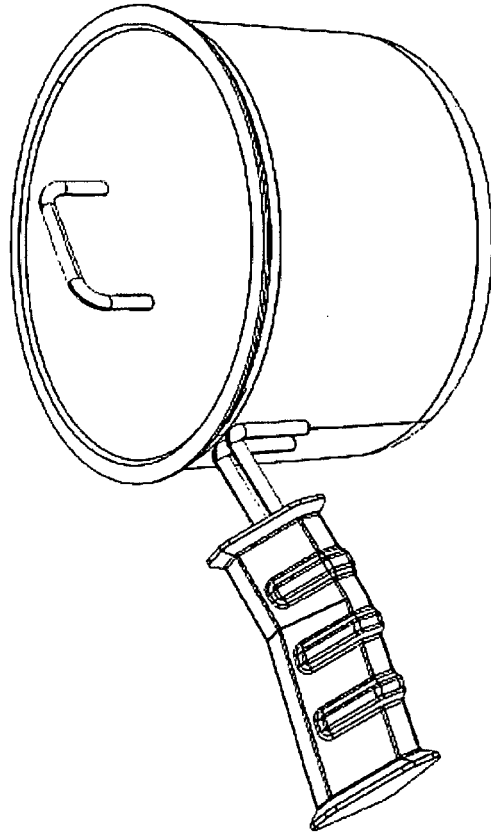


FIG. 162F

MEDIUM SAUCEPAN

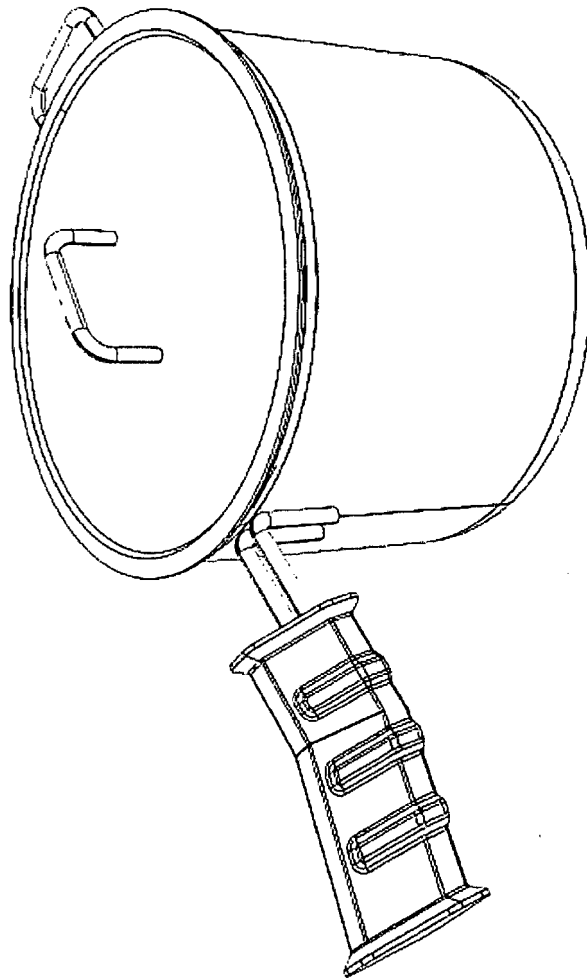


FIG. 162G

LARGE SAUCEPAN

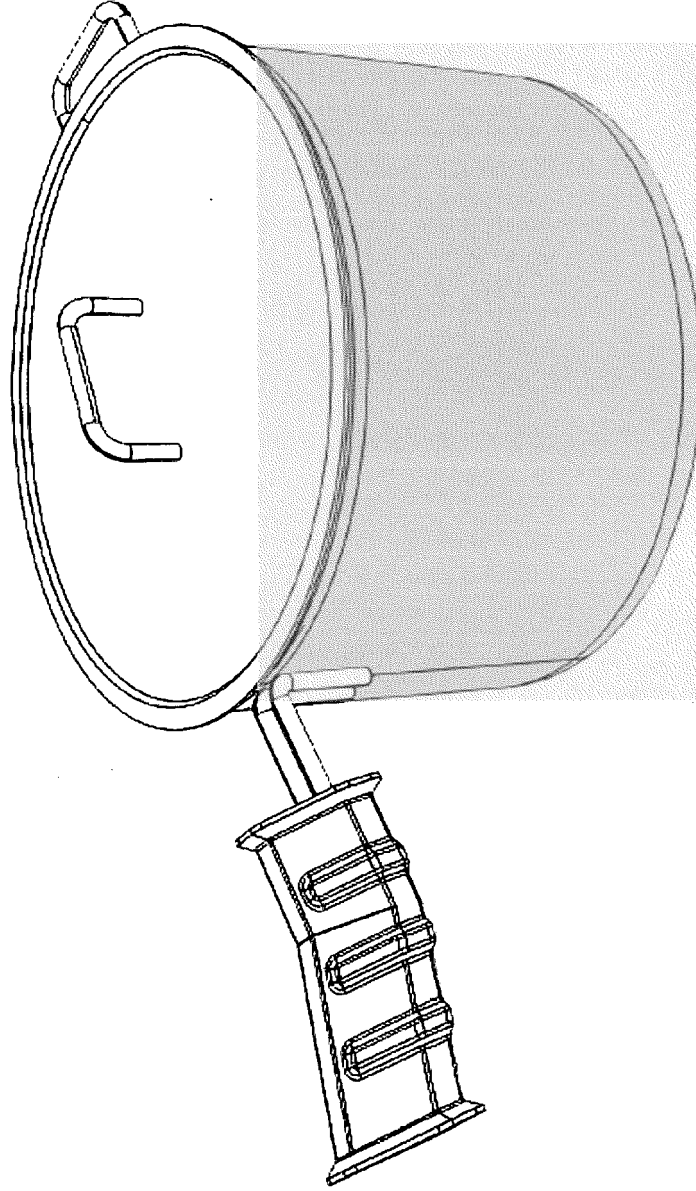


FIG. 162H

LARGE POT

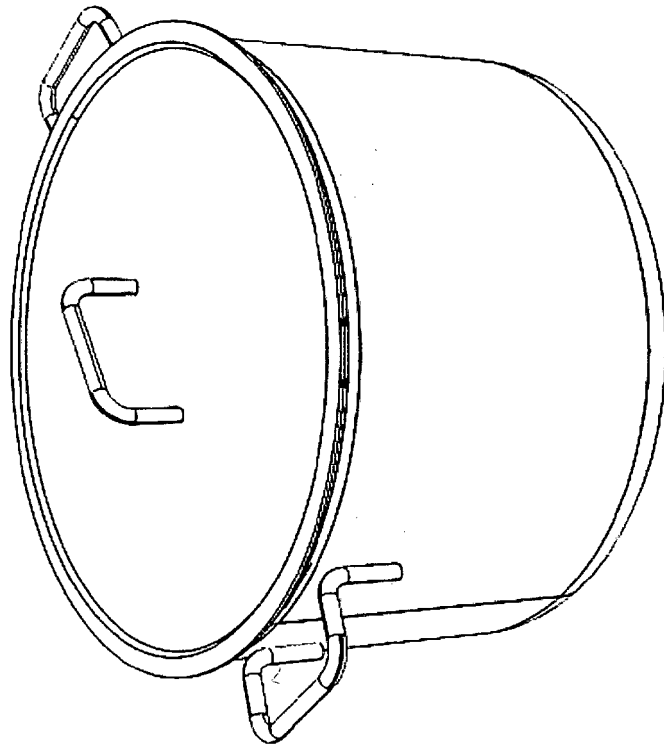


FIG. 162I

WOK

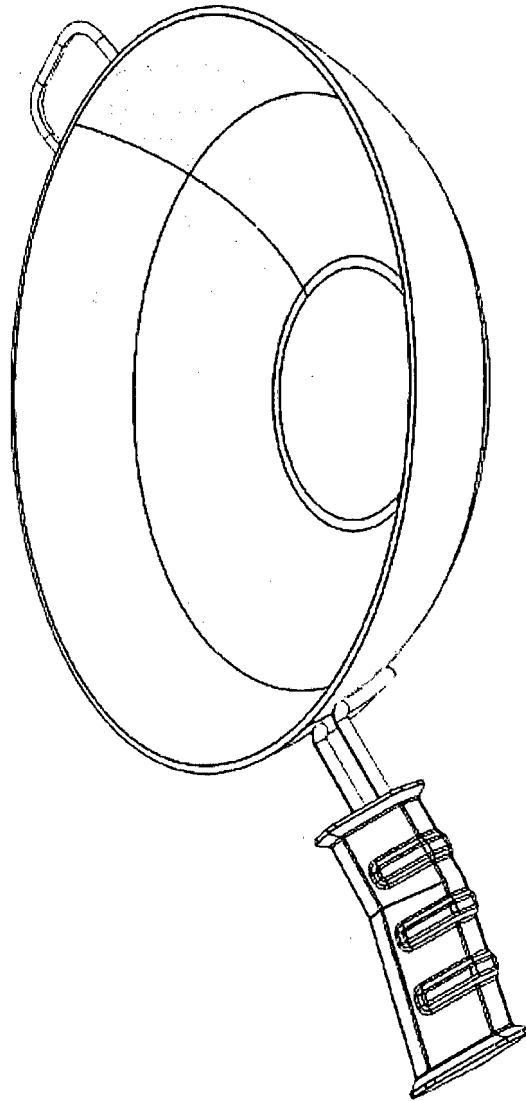


FIG. 162J

PASTA BASKET



FIG. 162K

SLAB

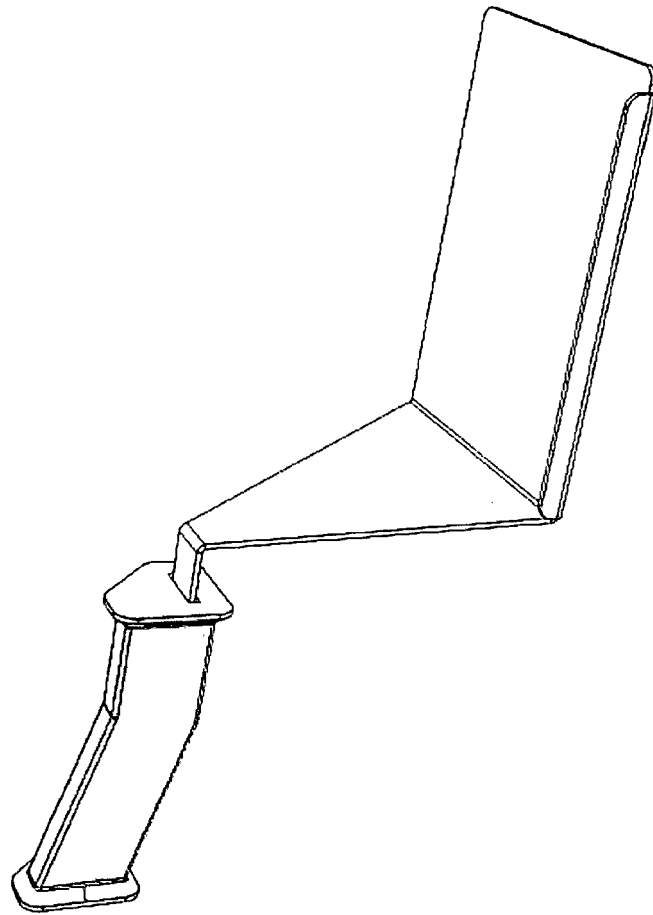


FIG. 162L

CHEF'S KNIFE

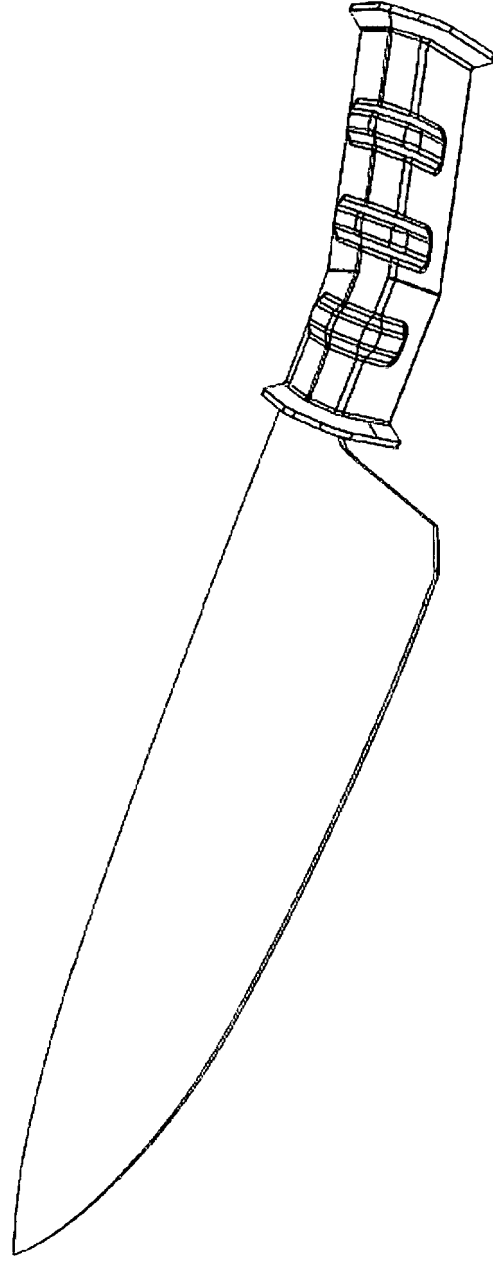


FIG. 162M

MEAT CARVING KNIFE

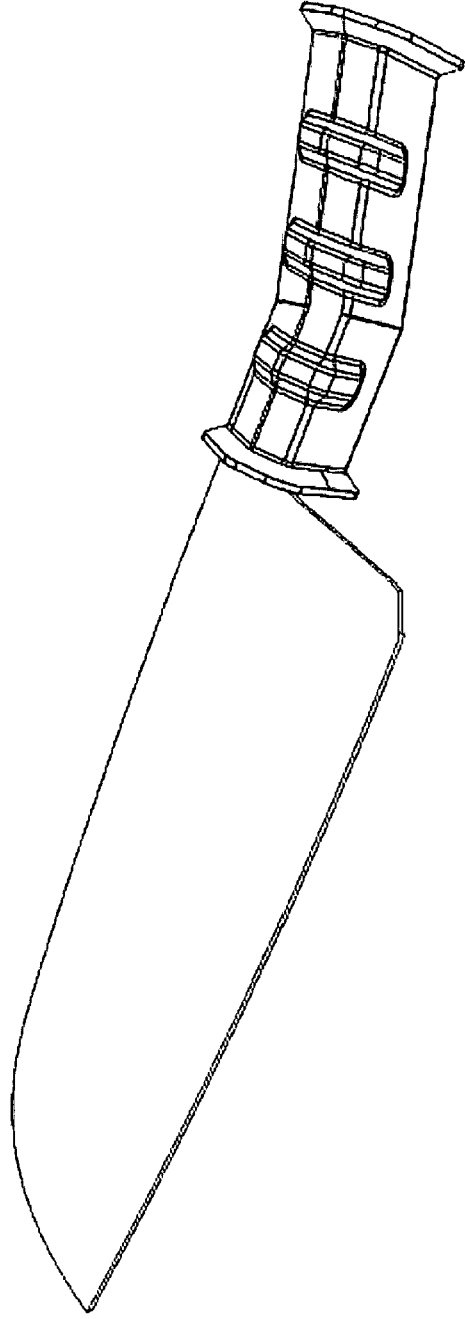


FIG. 162N

KNIFE FOR CUTTING

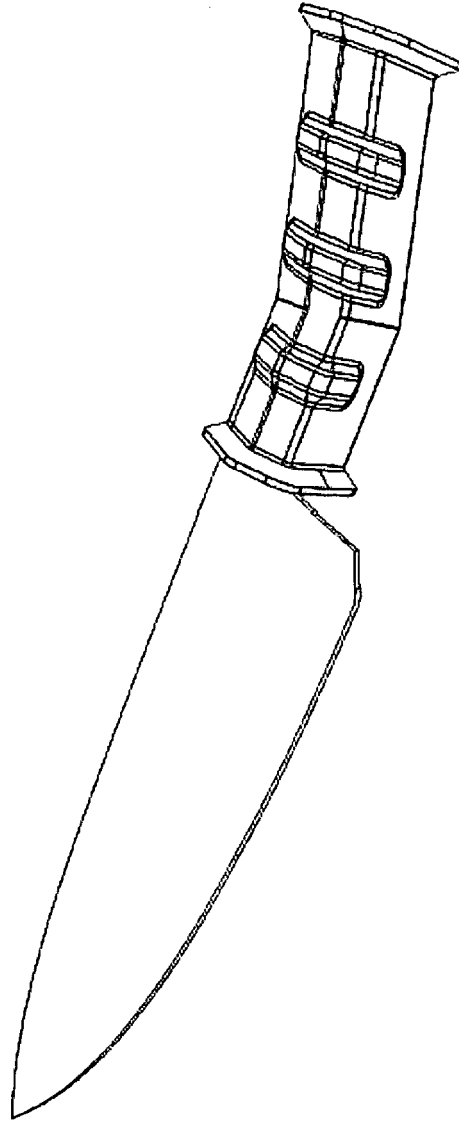


FIG. 1620

FILLET KNIFE

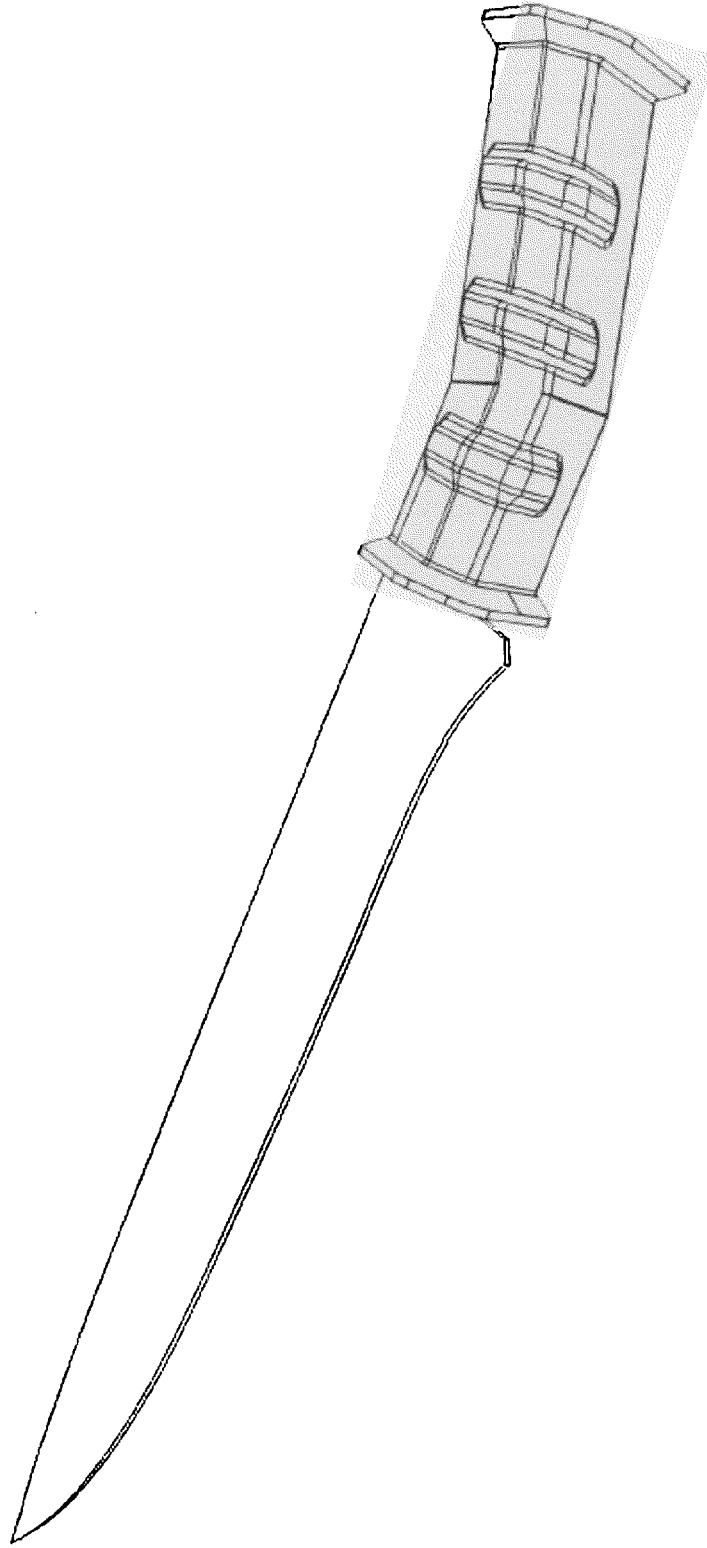


FIG. 162P

SLICER KNIFE

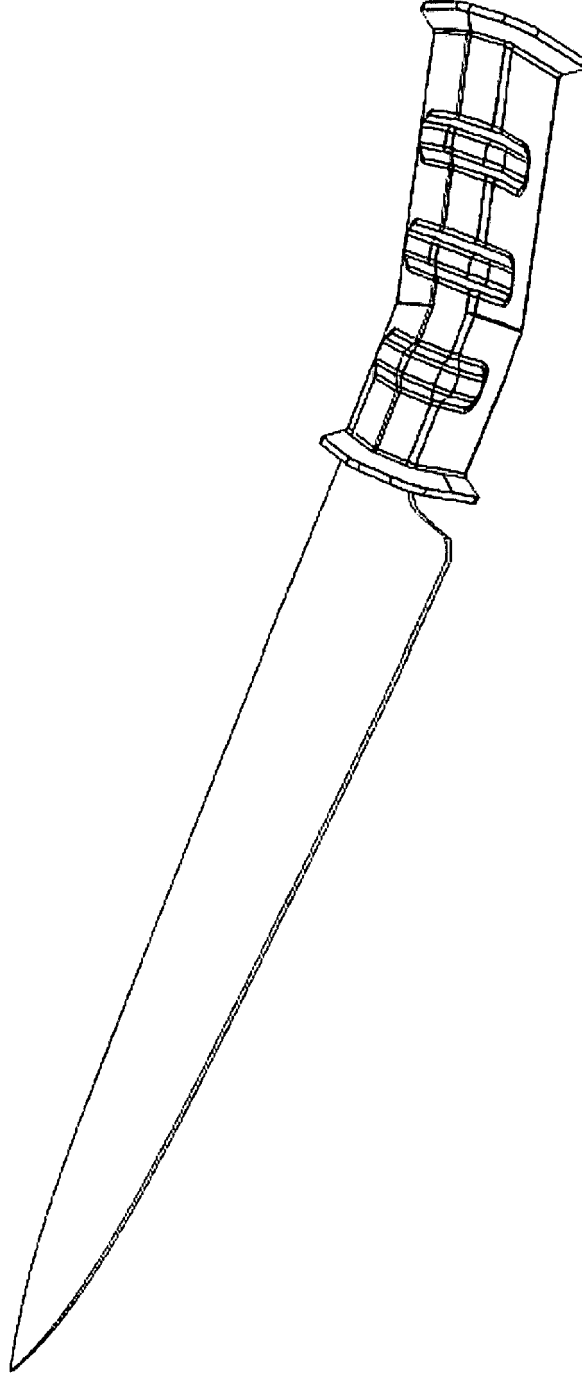


FIG. 162Q

UNIVERSAL KNIFE

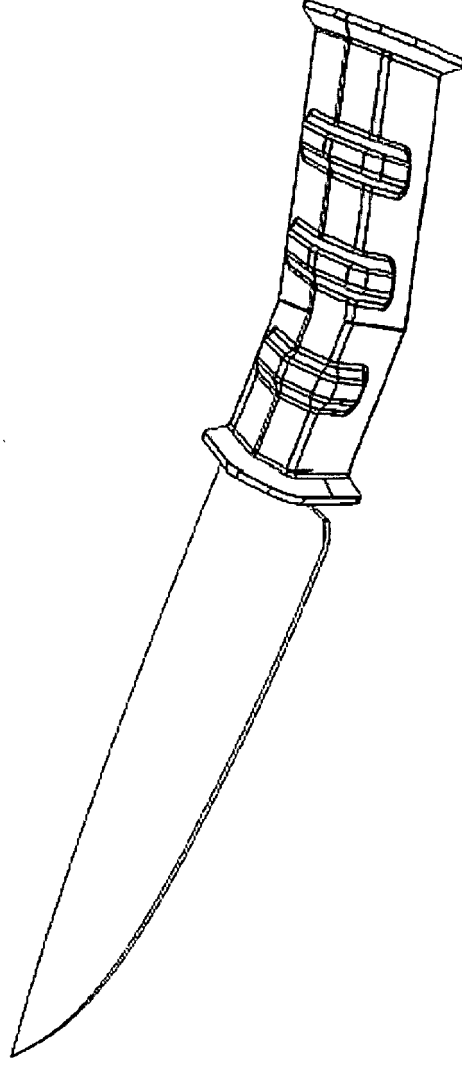


FIG. 162R

VEGETABLE KNIFE

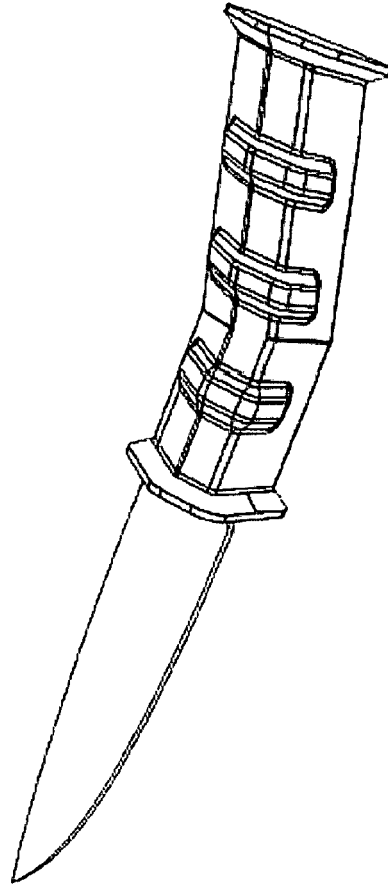


FIG. 162S

BLENDER

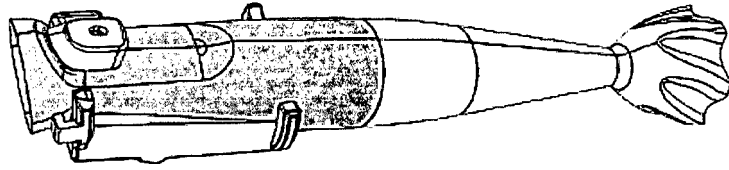


FIG. 163

SQUEEZY BOTTLE

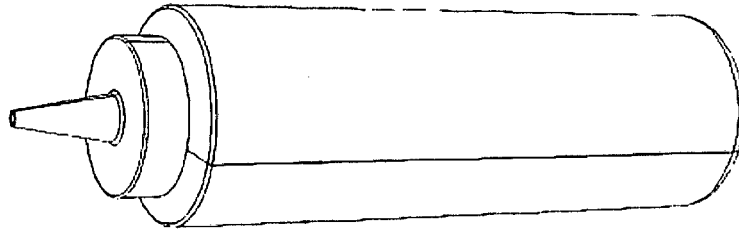


FIG. 164A

CONTAINER POT LARGE

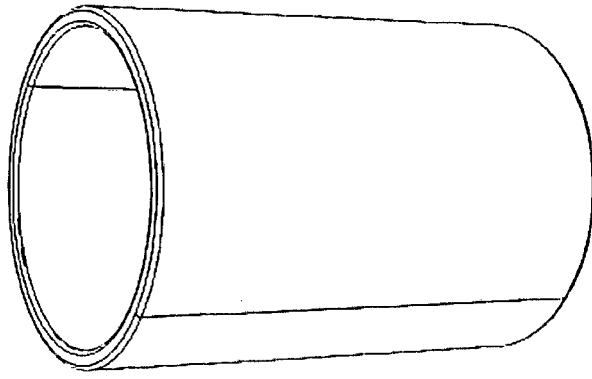


FIG. 164B

SMALL CONTAINER

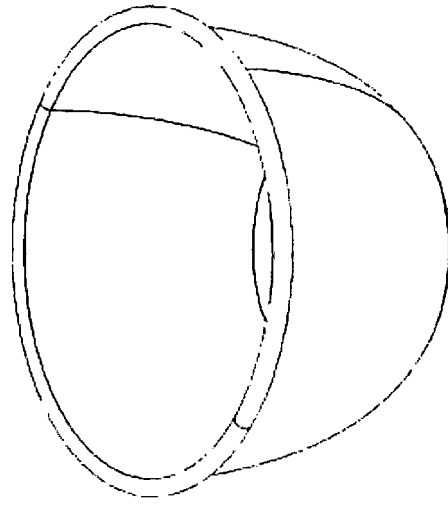


FIG. 164C

No #	#num	Group verb	Manipulation	The result of manipulation		Ingredients	Whither?	Variables	Using a hand	possible options	Convenient containers	Numbers of recipes
1.1	num_1	move	Move kitchen utensils (instruments), containers from initial position xyz(1) (with different ingredients, or empty) to target position xyz(2)	Moved item	Container number 2/4, Table soup plate, glass bowl deep, deep plastic bowls, table plates of small size, saucer, metal bowl, snack plate, a deep porcelain bowl, a glass measuring container, a soup dish, a dish pan flat, deep frying pan, a saucepan with a long handle, skillet, pot, pan, glass baking dish, baking sheet (dripping pan), ceramic baking dish, form cheesecake socket sauce drushlak, cutting board, grater, paper towels, Sieve - with the coordinates xyz (coordinates of a center of the utensil)	Empty, potatoes, mushrooms (champignons), water (cold, hot), berries, perch fillet, cod, salmon; grated parmesan casserole, cheese, any other content.	Any place at work surface, oven, under the grinder, snack plate, sink, into pots and plates, etc	Item from standard object library SOL(n), Initial position xyz(1), target position xyz(2), initial orientation, target orientation, moving speed, the trajectory of movement xyz(a...z), type of holding	R,L,R L	Taking the edge, taking the handle, taking the side	2 / 4	26

FIG. 165A

№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	Ingredient position	Whither?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
2.1	num_2	pour (liquid ingredients)	Pour the contents of kitchen utensils/containers from initial position xyz(1) to target position xyz(2)	Poured ingredients	cucumber pickle, sake, vinegar, olive oil, vegetable oil, milk, wine, brandy, truffle butter, yogurt, water, cream, vegetable broth, chicken broth, boiling water with pasta, sauce, vine, soy sauce, onion soup, egg yolk, cream, milk with beaten egg yolk, milk with beaten egg yolk and cream, marinade, berries jam, liquid smoke	Container No. 2, 4, 7 with the coordinates xyz Saucepan with the coordinates xyz Frying pan with the coordinates xyz Casserole with the coordinates xyz Metal bowl with the coordinates xy Glass bowl with the coordinates xy the coordinates xy gauge tank with the coordinates xyz dipper with the coordinates xyz	Soup plate, dipper, container (4), frying pan, saucepan, saucer, saucepan, bake ware, pots, glass measuring container, drushlak, deep metal bowl, glass bowl, sieve	SOL(n), Initial position xyz(1), target position xyz(2), initial orientation, moving speed, the trajectory of movement xyz(a...z), type of holding, speed of turning (pouring), angle of inclination of SOL(n), waiting time, helping tool SOL(x)	R, L, R L	tables, spoon, a small shovel, small spoon, ladle, whisk, a small plastic spatula	2 / 4 / 7	25

FIG. 165B

No #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	Ingredient position	Variables	Using a hand	Utensils	Convenient containers	Amount of recipe
3.1	num_4		Stir ingredients by any utensil SOL(n)	The mixed ingredients	Sliced vegetables: cucumbers, onions, parsley, carrots, cabbage, potatoes. Chopped chicken with mushrooms and chicken broth, minced beef, lasagna pasta, garlic, eggs, thick yoghurt-based sauce with garlic, butter with cookie crumbs, fresh berries (raspberries, strawberries, red currants), milled berries, crushed cookies, berry mix, chocolate mix, olive oil, vegetable oil, liquid sauce, pork fillet pieces in sauce, mushrooms, pickled cabbage with tomato paste and olive oil, a liquid marinade, milk and cream, fresh eggs with seasoning Knorr, turmeric, mayonnaise with mustard	Dining plate, cutting board, baking dish with the coordinates xyz, pan with the coordinates xyz, stewpot with the coordinates xyz, pot with the coordinates xyz deep glass dish with the coordinates xyz deep dining plate with the coordinates xyz saucer with the coordinates xyz, deep frying pan with the coordinates xyz, sieve coordinates xyz, deep metal bowl with coordinates xyz,	mixing appliance SOL(1), Initial SOL(1) position xyz(1), initial SOL(1) orientation, target utensil with ingredients SOL(2) position xyz(2), target SOL(2) orientation, moving speed, the trajectory of mixing xyz(a...z), speed of mixing, numbers of cycles	R, RL	Tongs, blades (wood, silicone), fork, kitchen spoon, teaspoon, tablespoon, blender, whisk, mixers, a small plastic shovel		23
		stir									

FIG. 165C

No #	#num	Group verb	Manipulation	The result of manipulation	Equipment	What (by what)?		Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
4.1	num_5	Switch on/off	Switch on/off or operate the equipment	Switched on / off equipment, set the mode	Stove, food processor, oven, faucet, the mixer, dishwasher, induction	fingers		Equipment SOL(1), switch (n), switch(n) initial position, switch(n) target position, time of holding, trajectory of movement, speed of movement	R,L			22
4.2	num_6	Open/Close	Close / open the door of equipment		Oven, refrigerator, microwave, dishwasher	fingers		Equipment SOL(1), door open, door close, trajectory of movement, speed of movement	R,L			9
5.1	num_7	pour (dry ingredients)	Pour the dry ingredients from kitchen utensils/ container into other position/utensils/container	Poured ingredients into target place	Flour, sugar, grated parmesan cheese, mushrooms, pickled vegetables, fried pieces of meat, cut vegetables: bell pepper, hot chili peppers, mushrooms, pickles, onion shallots, garlic, red onion; sauerkraut, boiled rice, cherry tomatoes, white crab meat, crumbled chocolate, coconut shavings, berries, starch, spices Knorr, pine nuts, turmeric, slices of roast pork, slices of sweet pepper, flour, steamed rice, pasta, broccoli, small slices of ham	From where (to take)?	Whither?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
								Container/utensils SOL(1), SOL(1) initial position xyz(1), SOL(1) initial orientation, trajectory of SOL(1) movement xyz(a..z), position of pouring (turning of SOL(1)) xyz(2), speed of turning, angle of inclination of SOL(1), helping tool SOL(2)	R,L,RL	Table spoon	2 / 3 / 4	22

FIG. 165D

5.2	num_8	pour (dry ingredients)	Pour the contents of food film with xyz coordinates into anything with the coordinates xyz	Poured crumbs from one place to another	crumbled cookies	Food film	Dining soup plate with the coordinates xyz	Food film with ingredient initial position xyz(1), trajectory of food film movement with xyz(a..z), point of pouring position xyz(2), speed of turning, angle of inclination	R,L,RL	-	-	1
No #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	From where (to take)?	Where?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
6.1	num_9	Add salt / pepper / sugar / spices	Season anything into any kitchen utensil using anything (seasoning) from a container number 2, 3 or mill	Seasoned ingredient	Salt, pepper, seasoning, red pepper, cinnamon, cumin seasoning, spices for meat, coriander, curry, voisko, brown sugar	Container for salt/sugar/spices, mill(electric/manual)	Pan, cutting board, frying pan, saucepan	Container/mill SOL(1), Initial position of container SOL(1) xyz(1), SOL(1) orientation, trajectory of SOL(1) movement xyz(a..z), position of pouring (turning of SOL(1)) xyz(2), speed of turning, angle of inclination of SOL(1), number of turning cycles, pressing button time (in case of using electric mill), helping tool SOL(2)	R,RL	tablespoon, teaspoon	2 / 3	23

FIG. 165E

№ #	#num	Group verb	Manipulation	Ingredients	From where (to take)?	Where?	Variables	Using a hand	Suitable tools to help	Amount of recipe
7.1	num_10	Slice / Cut	Cut / chop ingredients on the cutting board	Chopped ingredients in pieces Fillet of beef, chicken, pork, liver, bacon, octopus, turkey	Container, working surface, any plates, pans, frying pans with the coordinates xyz	Cutting Board	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).	RL	Universal (utility) knife, small knife, kitchen processor	1 / 3 / 4 21
7.2	num_11	Slice / Cut		Chopped ingredients in a fine shredding Onions: white, red, parsley, onion pen, dill (fresh herbs), Chinese cabbage, garlic, cummin, shallots, chives, lettuce, celery			Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).		Universal knife, small knife, food processor	

FIG. 165F

7.3	num_1 2	Slice / Cut	Chopped ingredients in the form of pieces (except the meat)	Flapjack (pita), pineapple, bell pepper, lemon	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1) .	Universal knife, small knife		
7.4	num_1 3	Slice / Cut	Cut slices of ingredients	Mushrooms: champignons, oyster mushrooms, wild mushrooms. Chile pepper, cucumber, cherry tomatoes, vanilla pod, pod green onions, garlic, pineapple, bell pepper, potatoes, carrots, celery, cauliflower, onions	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1) .	Universal knife, small knife		
7.5	num_1 4	Slice / Cut	sliced ingredients into cubes	Fillet of beef, chicken, pork, liver, bacon, chorizo sausage	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1) .	Universal (utility) knife, small knife		

FIG. 165G

7.6	num_1 4.1	Slice / Cut		sliced ingredients into cubes (well cut ingredients)	Mushrooms, bell peppers, chili peppers, potatoes				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1) .	Universal (utility) knife, small knife
7.7	num_1 5	Slice / Cut		Cut in half ingredient	Fresh cucumber, cherry tomatoes, onions, baguette, zucchini, mini corn				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1) .	Universal (utility) knife, small knife
7.8	num_1 6	Slice / Cut		sliced bread	baguette				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1) .	Universal knife

FIG. 165H

7.9	num_1 6.1	Cut	Delete the core of the ingredient	The bread, a slice of bread. lemon, tomato, bell pepper, zucchini				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).	Utility knife, teaspoon		2
7.10	num_1 6.2	Slice / Cut	Cut in slices	Sausage, cheese, carbonate, large chunks of dried meat, ham, cuttlefish, roll				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).	Universal knife		3
7.11	num_1 6.3	to Cut	Cut any shape / or cut into pieces with defined form (square, triangle, ravioli, etc.)	Potatoes, Pumpkin, Dough				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).	Utility knife, small knife, molds		3

FIG. 165I

7.12	num_1 6.4	to Slice		cut the broccoli into small sprigs	broccoli				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).	Universal knife		1
7.13	num_1 6.5	to Slice		cut chicken breast into thin slices across the width of the breast using a utility knife	chicken breast				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).	Universal knife		1
7.14	num_1 6.6	to Slice		cut the apple into fine strips	apple				Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size, appliance(knife/processor) SOL(1).	Universal knife		1

FIG. 165J

№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	From where (to take)?	Whither?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
8.1	num_1 7		Move ingredient (s) from initial position to required position	Moved ingredient in required place	Fillet of beef, pork, chicken, chicken feet; fish fillets, Flapjack (Pita) pita, onions: white, red; Shallots, Lemon, Peeled potatoes, parsley, basil, onion pen, spinach, thyme, basil, tarragon (wormwood), chopped parsley, dill; Mushrooms: champignons, oyster mushrooms, honey agaric, shredded carrots, shredded cabbage, sliced cucumber, sliced meat, liver, chopped (bacon, potatoes, cabbage, onions, pieces of meat, bacon, cherry tomatoes, onion, chili peppers, garlic cloves, vanilla pods, pieces of beef liver), Chinese cabbage, roll of the dough, pickled vegetables, fried potatoes, fried pieces of pork, ground beef, grilled onions, parsley and dill; Paste "lasagna", ground beef, grated cheese, Flapjack (Pita), Liver dough, pancakes, sour cream, mustard, tomato paste, whipped eggs with parmesan cheese, thick sauce, couscous, biscuits, butter, cookies, berry mix, melted chocolate, cooked fillet, boiled chicken wings, potato, onion, baguette, sliced baguette, sugar, meat rolls with stuffing (Kibbeh), pineapple pieces, cabbage, Kibbeh, tagliatelle pasta, omelet, pickling cabbage in saffron sauce, cherry tomatoes, paper for baking, chicken pie with mushrooms, pasta carbonara, vanilla pod, The pulp of vanilla, Dashi Kombu (kelp) with dry chopped chili pepper, seaweed combo burgers (cutlets), dark crab meat, minced meat, Beef Cube (Knorr), octopus, squid, zucchini, ginger root, condensed cream of mushroom soup, mini-corn	The container number 1, 3, 4, 5, bowls, paper towels, pans, metal containers, cutting boards, bowls, saucepan, deep metal bowl, dripping pan, deep snack dish, plastic bowls, baking dish, nozzle for Kibbeh	Bowls, paper towels, pans, metal containers, cutting boards, saucepan, deep metal bowl, baking sheet (dripping pan), deep snack dish, plastic bowls, baking dish, nozzle for Kibbeh	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, moving speed, the trajectory of movement xyz(a...z), type of holding, helping tool SOL(1)	R,L,RL	Universal knife Silicone spatula skimmer hands tablespoon Plastic blades tongs dining fork Kitchen spoon Small knife Wooden sticks for sushi	1, 3, 4, 5 19	
		move										

FIG. 165K

№	#num	Group verb	Manipulation	The result of manipulation	Ingredients	In what?	Variables	Using a hand	Helping tools	Suitable tools to help	Convenient containers	Amount of recipe
9.1	num_1 8	turn	Flip ingredient	turn mixture of pieces	Slices of beef, chicken	Frying pan, dining soup plate	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, turning speed, type of holding, helping tool SOL(1)	R,L, RL	Tongs, blades (wood, silicone), fork		7	
9.2	num_1 9			Turn whole pieces	meat rolls with stuffing (Kibbeh), fillet of cod, fillet of salmon, cutlets, chicken fillet, steak							
9.3	num_2 0			Flip (turn) pancakes	Pancakes, Flapjack							
№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	From where (to take)?	Whither?	Variables	Using a hand	Suitable tools to help	Convenient containers	Amount of recipe
10.1	num_2 1	break	Beat the egg taking it out of the any containers and break it anywhere	To place the egg content in a bowl	Egg	Container number 4	Deep metal bowl	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target content ingredient position xyz(2), helping tool SOL(1)	RL	utility knife	4	9
10.2	num_2 2			Separated the yolks from the glairs	white, yolk	Any utensils or container	Deep metal bowl, deep plastic bowl, glass bowl, ceramic bowl	Utensil / container SOL(1), SOL(1) Initial position xyz(1), helping tool SOL(x)	RL			4

FIG. 165L

№ #	№ num	Group verb	Manipulation	Ingredients	From where (to take)?	Whither?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
11.1	num_23	shake	Shake ingredients	Mushrooms: champignons, oyster mushrooms, honey agaric; spaghetti, bell pepper, baby corn, carrots, pieces of meat	Containers, working space	Bowl, container	Container/bowl SOL(1), SOL(1) initial position xyz(1), SOL(1) initial orientation, target SOL(1) position xyz(2), shaking speed, shaking trajectory xyz(a...z), number of shaking cycles, shaking time	R,L,RL			6
11.2	num_24	Group verb	Manipulation	The result of manipulation	From where (to take)?	Whither?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
12.1	num_24	squeeze	Squeeze the juice from the fruit or vegetable	squeezed juice	Container Number 4	Frying pan, glass, pan, bowl, cup	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target squeezed juice position xyz(2), moving speed, the trajectory of movement xyz(a...z), helping tool or equipment SOL(1)	R,L,RL	Juicer	4	2
12.2	num_25	squeeze	Squeeze garlic	garlic juice	Container	Frying pan, soup plate		R,L,RL	garlic press		1
12.3	num_24	squeeze	Squeeze the juice from the fruit or vegetable	squeezed ingredient	Container Number 4	Frying pan, Metal bowl	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target squeezed juice position xyz(2), moving speed, the trajectory of movement xyz(a...z)	R,L,RL		4	2

FIG. 165M

№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	From where (to take)?	Whither?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
13.1	num_26	Peel	Peel ingredients taking them from utensils/container. After the manipulation, put them into required place/utensil/container	peeled ingredients	Carrots, onions, shallots, cucumber, potato, pumpkin, shrimp, ginger, apple	Container Number 4/1	Above the work surface, cutting board, glass deep bowl	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, type of holding, helping tool SOL(1)	RL	Manual peeler, a small knife	4	7
13.2	num_26.1	to peel (to shell)	To shell the boiled egg and placed it in required place.	Shelled egg	boiled egg	Any utensils or container	required place	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2)	RL		4	1
№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	From where (to take)?	Whither?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
14.1	num_27	Grate	Grate ingredient using grater or food processor	Grinded (grated) ingredient	Cheese, peeled cucumber, carrot, nutmeg, ginger root	Container number 3, 4, 5; cutting board	Dining plate / cutting board / glass bowl / baking dish	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target grinded ingredient position, type of holding, helping tool SOL(1), processor operation mode/time	RL	Grater, food processor or	3 / 4 / 5	7

FIG. 165N

№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	From where (to take)?	Where?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
15.1	num_28	grease	Grease the dripping pan (baking sheet) by ingredient	greased surface	A mix of eggs and cheese, yoghurt sauce, egg yolk, butter	Bowl, container number 2	baking dish, baking sheet (dripping pan)	Container/utensils with greasing ingredient SOL(1), SOL(1) initial position xyz(1), SOL(1) initial orientation, greasing surface position, greasing surface size, greasing surface shape, trajectory of SOL(2)movement xyz(a..z), speed of greasing, helping tool SOL(2)	RL,R,L	Teaspoon with the coordinates xyz, silicone brush	2	4
№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	In what?	Where?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
16.1	num_29	roll	Roll ingredients in the flour, sauce, breadcrumbs	Rolled ingredient	Slices of pork fillet, cod fillet, minced meat, pasta "lasagna", eggplant, ham	Flour, thick sauce, breadcrumb, spices	Bowl, dining, plate, cutting board	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, container with second ingredient SOL(1), target ingredient position xyz(2), target ingredient orientation	RL			4
№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients		Where?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
17.1	num_30	wash	wash ingredients	washed ingredients	Carrots		Sink	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, moving speed, the trajectory of movement xyz(a...z), type of holding	RL			1

FIG. 1650

№ #	#num	Group verb	Manipulation		Ingredients		Where?	Variables	Using a hand	Suitable tools to help	Convenient containers	Amount of recipe
18.1	num_31	crush	crush ingredient	crushed ingredient	garlic clove		Cutting board	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, type of holding, helping tool SOL(1)	RL	Utility knife		2
19.1	num_32	Wrap / Open	Wrap ingredients in foil/paper on the working surface	wrapped ingredient	Flapjack, biscuits, sliced potatoes, roll of the dough	What (in what)?	Working surface	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, number cycles of wrapping	RL			4
20.1	num_34	Crumble	Crumble ingredient by any utensils	The result of manipulation	Parsley, bay leaf, thyme	From where (to take)?	Whither?	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, type of holding, helping tool SOL(1)	RL		2 / 4	2

FIG. 165P

№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	Where?	Variables	Using a hand	Helping tools	Amount of recipe
21.1	num_3 5	Chop	Chop ingredients by kitchen hammer on the cutting (chopping) board	Chopped ingredients	biscuit (cracker)	Cutting board	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, type of holding, helping tool SOL(1)	RL	Chop hammer with coordinates xyz	1
№ #	#num	Group verb	Manipulation		Ingredients	Where?	Variables	Using a hand	Helping tools	Amount of recipe
22.1	num_3 6	Condense	Condense ingredients in any utensils		Minced meat, the consistency of biscuits and butter	Form for cheesecake, deep metal bowl	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, type of holding, helping tool SOL(1)	RL	Table fork with the coordinates xyz	2
№ #	#num	Group verb	Manipulation		Types of nozzles	From where (to take)?	Whither?	Variables	Using a hand	Amount of recipe
23.1	num_3 7	Insert	Insert the nozzle in a food processor		for vegetables, farce	standard location with the coordinates xyz	Food processor (Kitchen kombain) with the coordinates xyz	Standard manipulation	RL	3
№	#num		Manipulation		Ingredients	Where from to take the ingredient?	Where to perform the manipulation?	Variables	Using a hand	Used containers
24.1	num_3 8		Insert any ingredient, taking from any utensils, into another ingredient			dripping pan, container number 4	Dining plate, snack plate	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, moving speed, the trajectory of movement xyz(a...z), type of holding	RL	4 2

FIG. 165Q

№ #	#num	Group verb	Manipulation	The result of manipulation	Ingredients	From where (to take)?	Whither?	Variables	Using a hand	Amount of recipe
25.1	num_4 0	to Pour / to Rinse	Pour the water / rinse from the tap into any utensils	Water poured into a bowl	water	Sink with the coordinates xyz	Saucepan	Utensil SOL(1), SOL(1) Initial position xyz(1), SOL(1) movement trajectory of SOL(1) target position xyz(a.z), SOL(1) target position xyz(2), speed of moving, the trajectory of movement xyz(a...z)	R,L,RL	1
26.1	num_4 1	cover / open	Cover any kitchen utensils with cover or towel, taking from the place	Closed (covered) / opened utensils	Saucepan, frying pan, baking dish	By cover, A big plate, paper towel, dough	Type of covering	Variables	Using a hand	Amount of recipe
26.2	num_4 1.1	Cover / remove	Cover the fillets with food film (cling film)		turkey breast	Food film with the coordinates xyz	full, leave a small gap	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, moving speed, the trajectory of movement xyz(a...z), type of holding	RL	7

FIG. 165R

№ #	#num	Group verb	Manipulation	The result of manipulation	What?	From where (to take)?	Where?	Variables	Using a hand	Helping tools	Convenient containers	Amount of recipe
27.1	num_42	Arrange / distribute	Arrange (lay) food foil / food film on the work surface	Laid foil / film on any surface	Food foil, Food film, food paper		The working surface, dripping pan (baking dish)	component initial position xyz(1), component initial orientation, target component position xyz(2), target component orientation, moving speed, the trajectory of movement xyz(a...z), type of holding	RL			2
27.2	num_43		any distributed products (ingredients) on a surface		Flour, cheese, sugar, bread crumbs, egg yolk	Container number 3, cutting board	Baguette, a baking dish, fillet	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, moving speed, the trajectory of movement xyz(a...z), type of holding	R,L,RL	Sieve	3	4
28.1	num_44	Tear off	Tear off a piece of any ingredient and put in any utensils	Cut off a piece of meat	Chicken fillet, herbs (basil)	Cutting board	Soup plate	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, required pieces size.	RL			1

FIG. 165S

№ #	№ #	Group verb	Manipulation				Whither?	Variables	Using a hand	Helping tools	Amount of recipe
29.1	num_45	Throw	Throw the used ingredients				Waste basket	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), the trajectory of movement xyz(a...z)	R		1
№ #	№ #	Group verb	Manipulation	The result of manipulation	Ingredients		Where?	Variables	Using a hand	Helping tools	Amount of recipe
30.1	num_46	Fold in half	Fold any ingredient in half in any utensils	Folded in half fillets	fish fillets		Dining soup plate	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation	RL	By hands	1
№ #	№ #	Group verb	Manipulation	The result of manipulation	Ingredients		Where?	Variables	Using a hand	Helping tools	Amount of recipe
31.1	num_47	Give shape	Make various forms to ingredients for baking on a dripping pan (baking sheet)	Shaping the product	Cheese		Dripping pan	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, moving speed, the trajectory of movement xyz(a...z)	RL	By hands	1
№ #	№ #	Group verb	Manipulation	The result of manipulation	Ingredients		Whither?	Variables	Using a hand	Helping tools	Amount of recipes
32.1	num_48	To strain	To strain different ingredients, using sieve into the pan	Strained sauce	Sauce		Pan	SOL(n), Initial position xyz(1), target position xyz(2), initial orientation, moving speed, the trajectory of movement xyz(a...z), type of holding, speed of turning (pouring), angle of inclination of SOL(n), waiting time	RL	Sieve	1

FIG. 165T

№	#num	Group verb	Manipulation	The result of manipulation	Ingredients	Where?	Variables	Using a hand	Helping tools	Amount of recipe
33.1	num_49	To roll	To roll dough on a paper for baking	Rolled dough	Dough	Paper for baking	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient shape, target ingredient orientation, moving speed, the trajectory of movement xyz(a...z)	RL	Rolling pin	1
34.1	num_50	To knead	To knead dough	Kneaded dough	Dough	Deep glass bowl	Variables Ingredient shape, ingredient size, ingredient initial position xyz, target ingredient shape, moving speed, the trajectory of movement xyz(a...z)	RL	Fingers	1
35.1	num_51	To pierce	To pierce ingredient	Pierced ingredient	Meat, Fillets	Cutting board, Snack plate	Variables Ingredient shape, ingredient size, ingredient initial position xyz, the trajectory of movement xyz(a...z), helping tool SOL(1), target position xyz(1), target orientation, moving speed, the trajectory of movement xyz(a...z)	R,RL	Tenderizer, Toothpick	1
36.1	num_52	To remove	Removed (flesh, viscera)		Shrimp	Cutting board	Variables Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, helping tool SOL(1), target position xyz(1), target orientation, moving speed, the trajectory of movement xyz(a...z)	RL	Toothpick	1

FIG. 165U

№	#num	Group verb	Manipulation	Ingredients	Where?	Variables	Using a hand	Helping tools	Amount of recipe
37.1	num_5 3	To dip (to sop)	To dip ingredient in sauce	Baby octopus, Sauce, Water	Saucepan	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, the trajectory of movement xyz(a...z), Number of dipping, time in a lower position	R	By hands	1
38.1	num_5 4	Touch up	To touch up the ingredient	Slices of bacon	In any bowl	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, moving speed, the trajectory of movement xyz(a...z)	R	By hands	1
39.1	num_5 5	Roll up	To roll up ingredient in a tube	Turkey breast	Cutting board	Ingredient shape, ingredient size, ingredient initial position xyz(1), ingredient initial orientation, target ingredient position xyz(2), target ingredient orientation, target ingredient shape	RL	By hands	1

FIG. 165V

Table A: Types of Equipment

	Types of Equipment
	KITCHEN ACCESSORIES
1	Funnels
1.1.	stainless steel funnel
1.2.	plastic funnel
1.3	silicone funnel
1.4	convertible funnel
2	Colanders
2.1	quadratic colanders
2.2	oval ladle-vases
2.3	colanders with folding handles
2.4	flat colander
2.5	plastic colanders
2.6	small round colanders
2.7	suspended colanders
2.8	cover-colander
2.9	stainless steel and aluminum colanders
2.1	cone colanders
3	Kitchen Appliances
3.1.	Whisk
3.2.	scoop, spatula
3.2.1	cook spatula
3.2.2.	spatula with slots
3.2.3.	confectionery spatula
3.5	Spoons
3.5.1	serving spoon
3.5.2	spoon-tongs
3.5.3	spoon with slots
3.5.4	spoon for rice
3.5.5	ladle spoon
3.5.6	ice cream spoon
3.5.7	honey spoon
3.5.8	spaghetti spoon
3.5.9	serving spoon
3.6	confectionery syringe for cookies and cream
3.7	soup ladle
3.8	Potato Masher
3.9	skimmer
3.10	Meat fork
3.11	Brush

FIG. 166A

3.12	coffee filter
3.5.7	honey spoon
3.5.8	spaghetti spoon
3.5.9	serving spoon
3.6	confectionery syringe for cookies and cream
3.7	soup ladle
3.8	Potato Masher
3.9	skimmer
3.10	Meat fork
3.11	Brush
3.23	ties for rolls
3.2	dough mini-scraper
3.25	grill tongs
3.26	spaghetti tongs
3.27	ice tongs
3.28	sugar tongs
3.29	package clip
3.30	package clip
3.31	citrus spray
3.32	Dough press
3.33	scoop for bulk
3.34	salad serving tongs (tweezers)
3.35	accessories for tubes
3.36	Pestle
3.37	Mortar
3.38	roller for cutting of the rings
3.39	opener for caps
3.40	meat tenderizer; meat softener
3.41	egg yolk separator
3.42	Apron
3.33	scoop for bulk
3.43	tools for decoration
3.44	jar for oil and vinegar
3.45	mug for milk boiling
3.46	napkins
3.47	tablecloth
3.48	marker for glasses
3.49	potato masher
3.50	Basket
3.51	meat tenderizer
3.52	cocotte
3.53	brush for washing of the vegetables

FIG. 166B

3.54	lids for cups
3.55	rope for baking
3.56	jar for herbs storage
3.57	Mortar
3.58	scraper for glass ceramic plates
3.59	Teapot for tea
3.60	clothespin for notes on the fridge
3.61	railing systems
3.62	hanger for kitchen tools
3.63	plunger with not adhering surface
3.64	silicone plunger
3.65	rolling pin with adjustable thickness
3.66	vacuum bags with pump
3.67	gas lighter
3.68	bone forceps
4	kitchen timers, thermometers
4.1	timer for meat roasting
4.2	digital thermometer
4.3	holder for thermometer
4.4	meat thermometer
4.5	digital timer
4.6	elector. digital timer
4.7	_aramel thermometer
5	Mills for spices
5.1	mill for black pepper
5.2	electric mill
5.3	combined mill for pepper and salt (2 in 1)
5.4	mill for spices
5.5	mill for greens
6	Measuring utensils
6.1.	Measuring container (plastic bottle)
6.2.	measuring jar
6.3.	measuring jug
6.4.	measuring bowl
6.5.	mechanical dispenser for ice cream
7	mechanical mixers
8	Bowl
8.1.	metal bowl
8.2.	stainless steel bowl
8.3.	plastic bowl
8.4.	plastic bowl
8.5.	bowls for food

FIG. 166C

9	Sets
9.2	wine set
9.3	sets for spices
9.6.	cupcakes baking set
9.7	accessory kit for baking
9.8	set of bar tools
9.9	set of kitchen tools
9.10	Set for eggs and pancakes baking
11	Slicing and cutting of products
11.1	Cutter
11.2	holder for onions cutting
11.2	cutting boards
11.3	universal professional knives
11.4	kitchen shears
11.5	hatchet
11.6	meat hatchet
11.7	Hammer for meat with hatchet
11.8	Hoe
11.9	Hammer for meat
11.10	Knives
11.11	knife for greens
11.12	knife for oranges
11.13	knife for kiwi
11.14	knife for pineapple
11.15	Spiral knife for carrots
11.16	multifunctional knife
11.17	vegetable knife
11.18	Pizza Cutter
11.19	universal knife
11.20	knife for slicing
11.21	cook knife
11.22	gastronomic knife
11.23	opener
11.24	Cheese knife
11.25	boning knife
11.26	lettuce knife
11.27	knife for steaks
11.28	butcher knife
11.29	shredding knife
11.30	bread knife
11.31	fish knife
11.32	knife for sandwiches
11.33	Santoku knife
11.34	knife for fruit coring
11.35	Butter knife

FIG. 166D

12	openers
12.1	tin-opener
12.2	corkscrew
12.3	corkscrew on a stand
12.4	lever corkscrew
12.5	folding corkscrew
12.6	opener for waiter
12.7	openers
13	stands and holders
13.1	stands for hot
13.2	stand for kitchen utensils storing
13.3	toothpick holder
13.4	Bottle holder
13.5	Holder for capsules
13.6	stand for spoon
13.7	stand for coffee capsules
13.8	Coasters
13.9	Napkin holder
13.10	stand for eggs
13.11	stand for openers
13.12	stand for scoops
13.13	stand for cooking and serving of eggs
13.14	stand for ladle
13.15	Holder for paper towels
13.16	Transforming stand for kitchen appliances
13.17	stand for mug
13.18	stand mugs and saucers
13.19	stand for kitchen knives
13.20	stand for chicken
13.21	napkin-stand
13.22	heated stand
13.23	stands for cake
14	Appliances for peeling and cutting
14.1	grater for vegetables
14.2	grater
14.3	garlic masher
14.4	egg cutter
14.5	Manual vegetable cutter
14.6	Peeler for vegetables
14.7	Nutcracker
14.8	The device for separating the yolks from the whites
14.9	grasping for carrots cleaning
14.10	scraper fish scales
14.11	cutter for fruits
14.12	roller for holes
14.13	tongs for fish bones

FIG. 166E

14.14	spiral vegetable cutter
15	Bottle Caps
15.1	champagne cork (stopper)
15.2	stoppers for wine
15.3	The opener to remove the crown corks from bottles
16	sieves
16.1	sieve for tea
16.2	sieve-tongs for tea
16.3	Strainer for spices
16.4	Strainer for tea
16.5	Universal sieve
16.6	flour sieve
16.7	sieve to form the "Bird's Nest"
16.8	The Chinese sieve with a mesh insert
16.9	sieve with support
16.10	Mug-sieve for flour
16.11	sieve on the handle
17	Salt and pepper shakers
17.1	container for seasoning
17.2	salt cellar
17.3	containers for oil and vinegar
18	Dish dryers
18.1	salad dryer
	dryer-placemat
	dryer for crockery and cutlery
19	Cutlery Accessories
19.1	cutlery tray
19.2	cutlery holder
19.3	cutlery container
19.4	strainer for cutlery
19.5	wall hanger for kitchen tools
19.6	cutlery organizer
19.7	mat for cutlery
19.8	sliding tray for cutlery
19.9	dryer for cutlery
19.10	glass for cutlery
19.11	napkin for the cutlery
19.12	case for cutlery
19.13	tray for cutlery
19.14	mitten-potholder
19.15	box for cutlery
19.16	full-size rack (cassette) for cutlery
19.17	Stand without containers for cutlery
19.18	cassette for cutlery
19.19	container for cutlery
19.20	station for cutlery
19.21	Shelf for cutlery
20	Decorations for cocktails
21.1	Ducts

FIG. 166F

22.2.	Sticks
23	Molds
23.1	molds for ice
23.2	molds for children
23.3	Molds for shaping products
23.4	Molds for dumplings
24	Measuring container
24.1	Measuring containers
24.2	A mixing container with the dispenser
24.3	Measuring container with the funnel
24.4	Beaker
24.5	Scoop
26	kitchen scissors
26.1	Scissors for BBQ
26.2	Kitchen scissors with bottle opener
26.3	Scissors for greens
26.4	Kitchen multipurpose scissors
26.5	Kitchen scissors for poultry
27	utensil for storages
27.1	container for storage
27.2	Bottles for liquid spices, oils
27.3	jars for storage
27.4	lunchbox
27.5	foldable lunchbox
27.6	jar for hermetic storage of bulk products
27.7	Sprayer for oil / vinegar
27.8	jar for bulk products
27.9	containers for spices
27.10	container for seasoning
27.11	Container for tea
28	potholders
28.1	oven-glove
28.2	silicone potholders
28.3	dishcloth
	railing with hooks
29	silicone mats
29.1	baking mat
29.2	mat for baking cakes
29.3	mat for drying of the glasses
29.4	cooking mat
29.5	Mat for drying of the dishes
30	graters, presses, rubbing machines
30.1	grater with a handle
30.2	grater
30.3	multifunction grater
30.4	grater shredder
30.5	grind for the green

FIG. 166G

30.6	grind for the garlic
30.7	Slicer for tomatoes
30.8	grater with rotating drums
30.9	universal device for grinding
30.10	mechanical grater
30.11	garlic peeling tube
30.12	rubbing machine
30.13	press for vegetables
30.14	press for garlic
30.2	press for hamburgers
31	knife sharpeners
31.1	electric sharpener
31.2	sharpening stone
31.3	ceramic sharpener
32	breadbox
33	lattice with legs
	Kitchen dishes
1	for alcohol
1.2	Brandy set with dispenser
1.3	souvenir cups
1.4	stemware
1.5	pail of ice
1.6	stemware
1.7	champagne bucket
1.8	stemware
1.9	carafe
1.10	server
1.11	bottle holder
2	tableware
2.1	first course dish
2.2	dish for bouillon
2.3	bouillon bowl
2.4	oiler
2.5	round dish
2.6	duck pan
2.7	Set for making chocolate fondue
2.8	Set for making cheese fondue
2.9	salad bowl
2.10	dish for cake
2.11	compartmental dish
2.12	set of cutlery
2.13	serving spoon and fork
2.14	dish with lid
2.15	steam table
2.16	ice-cream bowl
2.17	Flatware

FIG. 166H

2.18	saucer
2.19	saucer for jam
2.20	mustard-pot
2.21	pepper-pot
2.22	ash-pot
2.23	deep table plate
2.24	dinner plate
2.25	snack plate
2.26	deep dessert plate
2.27	dessert plate
2.28	plate for pies
2.29	horseradish-pot
3	Utensils for table
3.1	Pad for tableware
3.2	serving mat
3.3.	serving tray
3.4	glass burner
4	Dishes for tea, coffee, dessert
4.1	sugar-bowl
4.2	mug
4.3	mug with teapot
4.4	mug with stand
4.5	mug with lid
4.6	tea set
4.7	dish
4.8	french-press
4.9	teapot
4.10	teapot with strainer
4.11	glass teapot
4.12	ice-cream bowl
4.13	multifunctional vase
4.14	glasses
4.15	soup bowl
4.16	wicker basket
4.17	vase 3-tier
4.18	tea set
4.19	napkin rings
4.20	pannier for fruits
4.21	table trash basket
4.22	biscuit dish
4.23	candy dish
4.24	coffee sets
5	CUTLERY
5.1	Table fork
5.2	fork for sprat
5.3	fork for crayfish
5.4	fork for oysters
5.6	fork for lemons
5.7	big spoon

FIG. 166I

5.12	ladle-spoon
5.13	spoon for hot snacks
5.14	ice cream spoon
5.15	mustard spoon
5.16	salt spoon
5.17	spatula for cakes
5.18	spatula for caviar
5.19	spatula for fish
5.20	table knife
5.21	knife and fork for the fish
5.22	knife and fork snack
5.23	knife and fork dessert
5.24	Butterknife
5.25	tool kits for lobster, crayfish
5.26	devices for spices
5.27	grille and asparagus tongs
5.28	salad unit (salad fork and spoon)
5.29	sugar-tongs
5.30	tongs for cakes and sugar
5.31	ice tongs
5.32	can-opener
5.33	fork oyster
5.34	plug for crayfish
5.36	cocotte fork
5.37	fork for canned fish in oil (sprat, sardines)
5.38	spinner for champagne
5.39	spoon to mix whiskey with soda water
	Kitchen appliances
1	aerogrill
2	blenders, grinder
3	coffee Maker
4	coffee grinder (coffee mill)
5	Food Processor
6	mixer
7	mini oven
8	multicooker
9	meat grinders
10	steamers
11	Raclette grill
12	Juicers
13	toasters
14	egg cooker
15	electric range
15.1	electric induction stove
16	electric kettle
16.1	thermopots
17	bread makers
18	microwaves

FIG. 166J

	Children's dishes
1	Children Sets for baking
2	Children cutlery
3	Children thermoses
4	Children Sets of dishes
	List of ingredient data
1	Ingredient name
2	Ingredient Photo
3	Manufacturer
4	Country
5	Type of Ingredient
6	Type of cuisine
7	Relation to Vegetarianism
8	Spice
9	Energy value
10	Description of the Ingredient
11	Status
12	Price
	List of equipment data
1	Equipment name
2	Equipment photo
3	Manufacturer
4	Brand name
5	Dimensions
6	Weight
7	Connectivity
8	Type of cuisine
9	Type of equipment
10	Description of equipment
11	Year
12	Status
13	Price
	List of recipe data
1	Name of the recipe
2	Recipe author
3	Recipe Photo
4	Preparation time
5	Basis of the dish
6	Type of cuisine
7	Type of the dish
8	Relation to Vegetarianism
9	Spice
10	Energy value
11	Number of persons
12	Description of the recipe
13	Description of the stages of cooking
14	Ingredients
15	Type of equipment
16	Video of recipe cooking

FIG. 166K

18	Expert Rating
19	Amount of sales
21	Automatic cooking
22	Price

FIG. 166L

Table B: Types of Ingredients

1	MEAT and MEAT PRODUCTS
1	Basturma
2	Fat
3	brisket cooked and smoked
4	Hare
5	leather duck
6	Sausage
7	Sausages
8	Sausages "Hunting party"
9	Horsemeat
10	Bones with bone marrow
11	Roe
12	Rabbit
13	Meat
14	Moosemeat
15	Venison
16	Liver
17	Kidney
18	Smoked ribs
19	Salami
20	Sausages
21	Cervelat
22	Sausages
23	Hungarian smoked bacon
24	bacon fat-tailed
25	Steak
26	ribeye steak
27	Farce
28	crocodile fillet
29	Jamon
30	Choriso (spanish sausage)
31	Skewers
32	Sowbelly
33	Deer tongue
34	Frog legs
	LAMB, VEAL
1	breast of lamb
2	loin of lamb
3	blade lamb

FIG. 167A

4	veal brains
5	mutton ham
6	veal ham
7	leg of lamb
8	Heel muscle mutton
9	lamb offal
10	veal kidneys
11	lamb chops
12	gras cow
13	veal heart
14	lamb testicles
15	veal fillet
16	veal cheeks
17	minced lamb
18	minced veal
19	veal tail
20	veal tongue
21	eggs bullish
	BEEF
1	beef brisket
2	beef fillet
3	beef (sirloin)
4	beef on the bone
5	beef eye muscle
6	legs of beef
7	ham beef
8	gras beef
9	beef ribs
10	beef heart
11	minced beef
12	tail beef
13	beef tongue
	PORK
1	bacon
2	smoked bacon
3	Pork
4	Ham
5	pork brisket
6	smoked pork belly
7	Pork Intestine
8	legs of pork
9	boar ham
10	pork ham
11	pork ribs
12	knuckle of pork
13	Fat
14	pork (pork neck or loin)
15	pork ears
16	minced pork

FIG. 167B

17	pig tail
18	pork tongue
2	BIRDS
1	garshnep
2	turkey breast
3	chicken breast
4	chicken breast, smoked
5	duck breast
6	Goose
7	chicken ventricles
8	turkey
9	turkey wings
10	chicken wings
11	chicken
12	smoked chicken
13	grouse
14	Coot
15	duck leg
16	crow's feet
17	chicken legs
18	chicken ham
19	Quail
20	gras chicken
21	chicken giblets
22	grouse
23	chicken hearts
24	Duck
25	smoked duck
26	Pheasant
27	minced chicken
28	chicken fillet
29	foie gras
30	chicken
31	chicken gutted
32	neck duck
3	FISH and SEAFOOD
1	anchovies
2	arctic char
3	mullet
4	Black Sea goby
5	shrimp head
6	Butterfish
7	scallops
8	dorado
9	Ruff
10	caviar

FIG. 167C

11	red caviar
12	Tobiko caviar
13	Squid
14	flounder
15	cuttlefish
16	Carp
17	Sprat
18	Smelt
19	crab sticks
20	Shrimps
21	King shrimps
22	Salad shrimps
23	Tiger prawn
24	Bream
25	salmon
26	Smoked salmon
27	Mussels
28	Mussels with shells
29	Pollock
30	Molluscs
31	Sea food
32	Sea fish
33	sole (fish)
34	Crab meat
35	Krill meat
36	Burbot
37	Perch
38	Lobster
39	Cisco
40	sturgeon
41	octopus
42	baby octopus
43	shrimp broth
44	halibut
45	Pangasius
46	cod liver oil
47	Haddock
48	Crayfish
49	dried crustaceans
50	Hot smoked fish
51	red fish salted
52	Swordfish
53	Saury
54	Sardines
55	Herring
56	Salmon
57	smoked salmon
58	salted salmon
59	Seabass

FIG. 167D

60	Whitefish
61	Ramp
62	Mackerel
63	smoked mackerel
64	Sheatfish
65	Starlet
66	Walleye
67	Dried seaweed
68	Tilapia
69	Carp
70	Cod
71	Hot smoked cod
72	black cod
73	Tuna
74	Turbot
75	Eel
76	smoked eel
77	Snails
78	Oysters
79	white fish fillets
80	catfish fillets
81	fillet of carp
82	fish fillet
83	salmon fillet
84	salted herring fillets
85	perch fillet
86	Trout
87	smoked trout
88	Squid Ink
89	cervical shrimp
90	cervical cancers
91	Sprats
92	Pike
4	VEGETABLES
2	Artichokes
3	Eggplant
4	Yam
5	broccoli tops
6	beet tops
7	Broccoli
8	Rutabaga
9	Galangal
10	Peas
11	pea sprouts
12	pea pods
13	green peas
14	Daikon

FIG. 167E

15	Melon
16	Ginseng
17	Ginger
18	Zucchini
19	Feces
20	Cabbage
21	Brussels sprouts
22	Sauerkraut
23	Chinese cabbage
24	Cabbage
25	Romanesco cabbage
26	savoy cabbage
27	Cauliflower
28	Potatoes
29	young potatoes
30	Kohlrabi
31	root anise
32	salsify root
33	parsley root
34	celery root
35	fresh corn
36	white onion
37	pearl bow
38	onion
39	red onion
40	dry onion
41	small onion
42	Shallots
43	cassava
44	mini corn
45	mini peppers
46	mini-tomatoes
47	carrots
48	cucumber
49	parsnips
50	squash
51	bell peppers
52	cayenne pepper
53	fresh chili pepper
54	jalapeno peppers
55	tomato
56	pickled tomatoes
57	cherry tomatoes
58	sunflower sprouts
59	wheat germ
60	soybean seedlings
61	germinated soybeans
62	rhubarb
63	Radish

FIG. 167F

64	wild radish
65	Turnip
66	beansprouts
67	Beet
68	Asparagus
69	chopped tomatoes
70	Sweet
71	Pumpkin
72	green beans
73	Fennel
74	physalis
75	horseradish
76	zucchini
77	Garlic
78	endive
5	FRUITS
1	Apricot
2	Avocado
3	quince
4	fresh pineapple
5	Orange
6	banana
7	Hawthorn
8	cranberries
9	grapes
10	Cherry
11	Dried cherries
12	blueberries
13	Garnet
14	Grapefruit
15	Pear
16	Blackberry
17	strawberries
18	pomegranate seeds
19	carambola
20	Kiwi
21	Strawberry
22	Cranberry
23	coconut
24	gooseberry
25	kumquat
26	Lime
27	lemon
28	Litchi
29	raspberries
30	mango

FIG. 167G

31	Mandarin
32	Passionfruit
33	mini pineapple
34	Nectarine
35	buckthorn
36	papaya
37	Peach
38	Pomelo
39	Rowan
40	Drain
41	red currants
42	black currant
43	tamarind
44	Feijoa
45	fruit to taste
46	persimmon
47	cherries
48	Cherry
49	blueberries
50	Apple
51	frozen berries
52	juniper berries
53	fresh berries
6	GROCERY
1	Agar
2	Adjika
3	rice paper
4	vanilla extract
5	vermicelli rice
6	egg noodles
7	Algae
8	Glucose
9	Jam
10	raspberry jam
11	fresh yeast
12	Gelatin
13	liquid Smokehouse
14	Sweetener
15	corn muffins
16	Ketchup
17	citric acid
18	Candy
19	Confiture
20	strawberry jam
21	food dye
22	Starch

FIG. 167H

23	potato starch
24	corn starch
25	bread crumbs
26	Noodles
27	buckwheat noodles
28	Pad Thai noodles
29	rice noodles
30	glass noodles
31	noodles harusame
32	egg noodles
33	Mayonnaise
34	poppy sweet
35	Pasta
36	cannelloni pasta
37	pasta lumakoni
38	pasta feathers
39	fusilli pasta
40	pumpkin marmalade
41	jujube fruit
42	Marzipan
43	Mirin
44	coconut milk
45	almond milk
46	soy milk
47	Muesli
48	Pasta
49	peanut paste
50	red curry paste
51	tamarind paste
52	Tom Yam Paste
53	chili paste
54	Molasses
55	Pectin
56	Penne
57	Jam
58	elderberry syrup
59	vanilla syrup
60	syrup vishnevny
61	ginger syrup
62	caramel syrup
63	maple syrup
64	strawberry syrup
65	coffee syrup
66	corn syrup
67	raspberry syrup
68	mango syrup
69	honey syrup
70	almond syrup
71	walnut syrup

FIG. 167I

72	blackcurrant syrup
73	chocolate syrup
74	cranberry sauce
75	worcestershire sauce
76	pomegranate sauce
77	kimchi sauce
78	Pesto
79	fish sauce
80	fish sauce nampla
81	Tabasco sauce
82	teriyaki sauce
83	sauce tkemali
84	oyster sauce
85	sweet chili sauce
86	Japanese walnut sauce
87	spaghetti
88	crumbs of white bread
89	breadcrumbs
90	pastry decorations
91	candied
7	MILK PRODUCTS and EGGS
1	yogurt
2	natural yoghurt
3	Kefir
4	margarine
5	butter
6	melted butter
7	Milk
8	baked milk
9	buttermilk
10	curdled
11	cream
12	sour cream
13	Whey
14	Thane
15	Curd
16	curd beaded
17	quail eggs
18	Egg
8	MUSHROOMS
2	mushrooms
3	Ceps
4	Enoki mushrooms
5	Chinese dried mushrooms
6	portobello mushrooms
7	dried mushrooms

FIG. 167J

8	shiitake mushrooms
9	milk mushrooms
10	chanterelles
11	boletus
12	honey fungus
13	saffron milk cap
14	morels
15	truffles
16	meadow mushrooms
9	CHEESE
1	cheese
2	cheese Adyghe
3	brie cheese
4	feta cheese
5	Burrata cheese
6	Gouda cheese
7	Dutch cheese
8	blue cheese
9	Gorgonzola
10	grana padano cheese
11	Gruyere cheese
12	Dor Blue cheese
13	Camembert
14	goat cheese
15	cheese sausage
16	mascarpone cheese
17	Monterey Jack cheese
18	mozzarella cheese
19	soft cheese
20	goat cheese
21	parmesan cheese
22	pecorino cheese
23	processed cheese
24	cheese Poshehonsky
25	ricotta cheese
26	Roquefort cheese
27	blue cheese
28	cream cheese
29	suluguni
30	cheese curd
31	feta cheese
32	philadelphia cheese
33	cheddar cheese
34	edam cheese
35	Emmentaler cheese

FIG. 167K

10	NUTS and DRIED FRUITS
1	peanuts
2	barberry
3	walnuts (peeled)
4	raisins
5	Figs
6	Chestnut
7	Dried cranberries
8	coconut
9	dried apricots
10	Filbert (hazelnut)
11	almonds
12	Nuts
13	pine nuts
14	cashew nuts
15	Dried peaches
16	sunflower seeds
17	pumpkin seeds
18	Dried Fruits
19	Dates
20	Pistachios
21	Hazelnuts
22	Prunes
11	BEVERAGES
1	Water
2	water orange
3	mineral water
4	water pink
5	GABA-tea
6	Hibiscus
7	Kvass
8	bread kvass
9	Coke
10	Kuding
11	Lemonade
12	Mate
13	Juice
14	carbonated drink
15	Bitter Brandy
16	Rooibos
17	pineapple juice
18	orange juice
19	birch juice
20	grape juice
21	cherry juice
22	pomegranate juice

FIG. 167L

23	strawberry juice
24	cranberry juice
25	gooseberry juice
26	lime juice
27	mango juice
28	tangerine juice
29	peach juice
30	currant juice
31	tomato juice
32	apple juice
33	Sprite
34	Tonic
35	tea white
36	tea yellow
37	green tea
38	red tea
39	Puer tea
40	Puer tea in Mandarin
41	oolong tea
42	black tea
43	Espresso
12	ALCOHOL
1	Balm
2	Bitter
3	Brandy
4	Bourbon
5	Vermouth
6	Wine
7	white wine
8	sparkling wine
9	red wine
10	dry red wine
11	wine sangria
12	Whiskey
13	Vodka
14	anise vodka
15	Grappa
16	Gin
17	Irish cream liqueur
18	Calvados
19	Cachaca
20	Brandy
21	Liqueur
22	orange liqueur
23	coffee liqueur
24	chocolate liqueur

FIG. 167M

25	Madeira
26	Marsala
27	Martini
28	Beer
29	cherry beer
30	Port
31	Rum
32	white rum
33	black rum
34	Sake
35	sambuca
36	Cider
37	tequila
38	sherry
39	Champagne (Brut)
40	schnapps
13	GREENS AND HERBS
1	Basil
2	basil red
3	bouquet garni
4	oregano
5	greens
6	dried herbs
7	cabbage pak choi
8	chervil
9	cilantro
10	oxalis
11	oat root
12	fresh coriander
13	nettle
14	Watercress
15	watercress
16	rose petals
17	lemongrass
18	bamboo leaves
19	banana leaves
20	grape leaves
21	Grape leaves (salty)
22	kaffir lime leaves
23	lime leaves
24	dandelion leaves
25	green onion
26	Leek
27	marjoram
28	Chard
29	melissa

FIG. 167N

30	lemon balm
31	Mint
32	oregano
33	parsley
34	dried parsley
35	plantain
36	wormwood
37	chopped camomile
38	arugula
39	iceberg lettuce
40	green salad
41	corn salad
42	lettuce
43	leaf lettuce
44	salad Mizuno
45	Oakleaf lettuce
46	radicchio salad
47	romaine lettuce
48	salad Friess
49	salad mix
50	celery
51	Lemon grass (lemon grass)
52	Italian herbs
53	spicy herbs
54	Dill
55	dandelion flowers
56	flowers
57	lavender flowers
58	chicory
59	thyme
60	Ramson
61	saffron
62	rosehips
63	chives
64	spinach
65	sorrel
66	tarragon
14	Cereals, legumes and flours
1	beans
2	mung beans
3	bulgur
4	puffed rice
5	buckwheat green
6	Quinoa
7	buckwheat
8	corn grits

FIG. 1670

9	semolina
10	Oats
11	pearl barley
12	cereal wheat
13	couscous
14	Flour
15	buckwheat flour
16	chestnut flour
17	corn flour
18	almond flour
19	Chickpea flour
20	oat flour
21	wheat flour
22	rye flour
23	rice flour
24	Chickpeas
25	Bran
26	Millet
27	Figure
28	Figure baya
29	basmati rice
30	brown rice
31	wild rice
32	Round grain rice
33	semola (flour made from durum wheat)
34	Beans
35	white beans
36	red beans
37	buckwheat flakes
38	cereal grains
39	oat flakes
40	Lentils
41	Barley
15	Spices and Seasonings
1	star anise
2	white pepper
3	Vanillin
4	Vanilla
5	vanilla essence
6	vanilla powder
7	Wasabi
8	Caltrop
9	garam masala
10	Carnation
11	cloves minced
12	Mustard

FIG. 167P

13	sweet mustard
14	allspice peas
15	grain mustard
16	Cumin
17	ground ginger
18	Capers
19	Cardamom
20	Curry
21	Coriander
22	ground coriander
23	Cinnamon
24	coffee essence
25	balsamic cream
26	Sesame
27	Turmeric
28	bay leaf
29	lemon pepper
30	poppy seed
31	Olives
32	olives dry
33	avocado oil
34	anchovy butter
35	peanut oil
36	mustard oil
37	oil for frying
38	scented oil
39	grapeseed oil
40	canola oil
41	corn oil
42	sesame oil
43	linseed oil
44	olive oil
45	Peanut butter
46	sunflower oil
47	lean oil
48	vegetable oil
49	oil, refined
50	oil seed-bearing
51	soybean oil
52	truffle oil
53	oil pumpkin
54	almonds hammers
55	miso paste
56	sea salt
57	Nutmeg
58	Olives
59	Ligurian olives
60	hot red pepper
61	hot peppers

FIG. 167Q

62	Fenugreek
63	Paprika
64	lemongrass paste
65	peperoncini
66	pepper pink polka dots
67	Chili
68	Dried chili peppers
69	mustard powder
70	seasoning fish
71	baking powder
72	rosemary
73	pink ground pepper
74	Sugar
75	vanilla sugar
76	brown sugar
77	sugar muskovado
78	sugar cane
79	powdered sugar
80	nasturtium seeds
81	Nigella seeds
82	fennel seeds
83	spice mix "taco"
84	Soda
85	ginger juice squeezed
86	lemon juice
87	Salt
88	citrate
89	grape sauce
90	sauce narsharab
91	ponzu sauce
92	soy sauce
93	tomato sauce
94	chili sauce
95	Spices
96	sumac
97	thyme
98	cumin
99	Mediterranean herbs
100	French herbs
101	vinegar
102	balsamic vinegar
103	wine vinegar
104	white wine vinegar
105	red wine vinegar
106	cherry vinegar
107	raspberry vinegar
108	rice vinegar
109	apple cider vinegar
110	hops suneli

FIG. 167R

111	Savory
112	chutney
113	black pepper
114	black pepper peas
115	dry garlic
116	Sage
16	PREPARED PRODUCTS
1	canned pineapple
2	canned artichokes
3	Marinated artichokes
4	baguette
5	Loaf
6	Bars of chocolate
7	meringue
8	biscuit
9	beans, canned
10	Bun
11	buns for hamburgers
12	Broth
13	beef broth
14	chicken broth
15	fish broth
16	Jam
17	Apricot jam
18	lingonberry jam
19	cherry jam
20	black currant jam
21	raspberry jam
22	blueberry jam
23	Wafer
24	canned cherry
25	Glaze
26	Dijon mustard
27	croutons
28	marinated mushrooms
29	Demiglas apple
30	Yeast
31	Jelly
32	leaven
33	marshmallows
34	crushed tomatoes in juice
35	pickled ginger
36	Cocoa
37	marinated cactus
38	Pickled capers
39	sour cabbage

FIG. 167S

40	sea kale
41	Kimchi
42	wafer cakes
43	gherkins
44	natural coffee
45	instant coffee
46	Crackers
47	Chocolate Crumb
48	Croissant
49	bouillon cubes
50	canned corn
51	marinated corn
52	Pita
53	Lanspik
54	Ice
55	Letcho
56	lasagna sheets
57	canned salmon
58	pickled onions
59	canned mandarins
60	marshmallow
61	hazelnut oil
62	sweet curd
63	Yoghurt
64	Honey
65	honey in the comb
66	Mix ginger
67	condensed milk
68	condensed milk boiled
69	milk powder
70	pickled carrots
71	ice cream
72	vanilla ice cream
73	chocolate ice cream
74	salted cucumber
75	pickled cucumbers
76	pickled cucumbers
77	Pecans
78	beet broth
79	corn sticks
80	bread sticks
81	tomato paste
82	Pasta Chocolate
83	Pate
84	frozen dumplings
85	hot pepper pickled
86	canned peaches
87	Cookies
88	Biscuit

FIG. 167T

89	Cookies Savoiardi
90	chocolate cookies
91	Pita
92	Supplements
93	tomatoes in juice
94	canned tomatoes
95	Popcorn
96	Prosciutto
97	Gingerbread
98	mango puree
99	mashed potatoes
100	tomato puree
101	apple puree
102	pickle cucumber
103	Roll
104	Pickled beets
105	pork jerky
106	sugar syrup
107	whipped cream
108	cream of coconut
109	Malt
110	Sorbet
111	barbecue sauce
112	sauce bearnese
113	Béchamel
114	Worcestershire sauce
115	sauce Demiglas
116	sauce for soups "Bright udon"
117	sweet and sour sauce
118	Salsa
119	sweet sauce
120	chocolate sauce
121	berry sauce
122	asparagus, soya
123	caramel chips
124	crushed crackers
125	Tartlets
126	Tahini
127	pasta for lasagna
128	dough for ravioli
129	pizza dough
130	yeast dough
131	dough kataifi
132	shortbread dough
133	pastry dough
134	puff pastry
135	dough dry
136	filo pastry
137	dried tomatoes

FIG. 167U

138	Tortilla
139	Toast
140	Tofu
141	tuna fish oil
142	tuna canned in its own juice
143	Tahini
144	Rice Stuffing
145	Canned beans
146	white bread
147	toast bread
148	rye bread
149	sweet bread
150	black bread
151	rye bread
152	corn flakes
153	ciabatta
154	tea Away
155	potato chips
156	corn chips
157	Marinated mushrooms
158	chocolate corn balls
159	Chocolate
160	white chocolate
161	bitter chocolate
162	milk chocolate
163	dark chocolate

FIG. 167V**Table C: Lists of Food Preparation Methods and Equipment, Cuisine and Bases****A list of food preparation methods**

1;"0";"The fried"

2;"0"; The boiled"

3;"0"; The stewed"

4;"0";"The baked"

5;"0"; "The cut"

FIG. 168A

A list of Equipment

1;"0";" KITCHEN ACCESSORIES"

2;"1";"funnels"

3;"2";"stainless steel funnel"

4;"2";"plastic funnel"

5;"2";"silicone funnel"

6;"2";"convertible funnel"

7;"1";"colanders"

8;"7";"quadratic colanders"

9;"7";"oval ladle-vases"

10;"7";"colanders with folding handles"

11;"7";"flat colander"

12;"7";"plastic colanders"

13;"7";"small round colanders"

14;"7";"suspended colanders"

15;"7";"cover-colander"

16;"7";"stainless steel and aluminum
colanders"

17;"7";"cone colanders"

18;"1";"Kitchen Appliances"

19;"18";"whisk"

20;"18";"sco
op spatula"

21;"20";"cook spatula"

22;"20";"spatula with slots"

23;"20";"confectionery spatula"

24;"18";"spoons"

25;"24";"serving spoon"

26;"24";"spoon-tongs"

27;"24";"spoon with slots"

28;"24";"spoon for rice"

29;"24";"ladle spoon"

30;"24";"ice cream spoon"

31;"24";"honey spoon"

32;"24";"spaghetti spoon"

33;"24";"serving spoon"

34;"18";"confectionery syringe for cookies
and cream"

35;"18";"soup ladle"

36;"18";"potato masher"

37;"18";"skimmer"

38;"18";"Meat fork"

39;"18";"brush"

40;"18";"coffee filter"

41;"18";"whisk"

42;"18";"silicone brush"

43;"18";"silicone juicer"

FIG. 168B**FIG. 168C**

44;"18";"earthen saucer"

45;"18";"tea filter"

46;"18";"pump dispenser for oil and vinegar"

47;"18";"clip for silicone spoon for the edge of the pan"

48;"18";"transformed spoons for salad"

49;"18";"device for cherry seeds removing"

50;"18";"sink mat"

51;"18";"ties for rolls"

52;"18";"dough mini-scraper"

53;"18";"grill tongs"

54;"18";"spaghetti tongs"

55;"18";"ice tongs"

56;"18";"sugar tongs"

57;"18";"package clip"

58;"18";"package clip"

59;"18";"citrus spray"

60;"18";"Dough press"

61;"18";"scoop for bulk"

62;"18";"salad serving tongs (tweezers)"

63;"18";"accessories for tubes"

64;"18";"pestle"

65;"18";"mortar"

FIG. 168D

66;"18";"roller for cutting of the rings"

67;"18";"opener for caps"

68;"18";"meat tenderizer; meat softener"

69;"18";"egg yolk separator"

70;"18";"apron"

71;"18";"tools for decoration"

72;"18";"jar for oil and vinegar"

73;"18";"mug for milk boiling"

74;"18";"napkins"

75;"18";"tablecloth"

76;"18";"marker for glasses"

78;"18";"basket"

79;"18";"meat tenderizer"

80;"18";"cocotte"

81;"18";"brush for washing of the vegetables"

82;"18";"lids for cups"

83;"18";"rope for baking"

84;"18";"jar for herbs storage"

FIG. 168E

86;"18";"scraper for glass ceramic plates"

87;"18";"Teapot for tea"

88;"18";"clothespin for notes on the fridge"

89;"18";"railing systems"

90;"18";"hanger for kitchen tools"

91;"18";"plunger with not adhering surface"

92;"18";"silicone plunger"

93;"18";"rolling pin with adjustable thickness"

94;"18";"vacuum bags with pump"

95;"18";"gas lighter"

96;"18";"bone forceps"

97;"1";"kitchen timers thermometers"

98;"97";"timer for meat roasting"

99;"97";"digital thermometer"

100;"97";"holder for thermometer"

101;"97";"meat thermometer"

102;"97";"digital timer"

103;"97";"electr. digital timer"

104;"97";"aramel thermometer"

105;"1";"Mills for spices"

106;"105";"mill for black pepper"

107;"105";"electric mill"

108;"105";"combined mill for pepper and salt (2 in 1)"

109;"105";"mill for spices"

FIG. 168F

110;"105";"mill for greens"

111;"1";"Measuring utensils"

112;"111";"Measuring container (plastic bottle)"

113;"111";"measuring jar"

114;"111";"measuring jug"

115;"111";"measuring bowl"

116;"111";"mechanical dispenser for ice cream"

117;"1";"mechanical mixers"

118;"1";"bowl"

119;"118";"metal bowl"

120;"118";"stainless steel bowl"

121;"118";"plastic bowl"

122;"118";"plastic bowl"

123;"118";"bowls for food"

124;"1";"sets"

125;"124";"wine set"

126;"124";"sets for spices"

127;"124";"cupcakes baking set"

128;"124";"accessory kit for baking"

129;"124";"set of bar tools"

130;"124";"set of kitchen tools"

131;"124";"Set for eggs and pancakes baking"

132;"1";"Slicing and cutting of products"

FIG. 168G

133;"132";"cutter"	154;"143";"cook knife"
134;"132";"holder for onions cutting"	155;"143";"gastronomic knife"
135;"132";"cutting boards"	156;"143";"opener"
136;"132";"universal professional knives"	157;"143";"Cheese knife"
137;"132";"kitchen shears"	158;"143";"boning knife"
138;"132";"hatchet"	159;"143";"lettuce knife"
139;"132";"meat hatchet"	160;"143";"knife for steaks"
140;"132";"Hammer for meat with hatchet"	161;"143";"butcher knife"
141;"132";"hoe"	162;"143";"shredding knife"
142;"132";"Hammer for meat"	163;"143";"bread knife"
143;"132";"knives"	164;"143";"fish knife"
144;"143";"knife for greens"	165;"143";"knife for sandwiches"
145;"143";"knife for oranges"	166;"143";"Santoku knife"
146;"143";"knife for kiwi"	167;"143";"knife for fruit coring"
147;"143";"knife for pineapple"	168;"143";"Butter knife"
148;"143";"Spiral knife for carrots"	169;"169";"openers"
149;"143";"multifunctional knife"	170;"169";"tin-opener"
150;"143";"vegetable knife"	171;"169";"corkscrew"
151;"143";"Pizza Cutter"	172;"169";"corkscrew on a stand"
152;"143";"universal knife"	173;"169";"lever corkscrew"
153;"143";"knife for slicing"	174;"169";"folding corkscrew"
154;"143";"cook knife"	175;"169";"opener for waiter"
	178;"494";"stands for hot"

FIG. 168H**FIG. 168I**

179;"494";"stand for kitchen utensils storing"
 180;"494";"toothpick holder"
 181;"494";"Bottle holder"

 182;"494";"Holder for capsules"

 183;"494";"stand for spoon"

 184;"494";"stand for coffee capsules"

 185;"494";"Coasters"

 186;"494";"Napkin holder"

 187;"494";"stand for eggs"

 188;"494";"stand for openers"

 189;"494";"stand for scoops"

 190;"494";"stand for cooking and serving of eggs"

 191;"494";"stand for ladle"

 192;"494";"Holder for paper towels"

 193;"494";"Transforming stand for kitchen appliances"

 194;"494";"stand for mug"

 195;"494";"stand mugs and saucers"

 196;"494";"stand for kitchen knives"

 197;"494";"stand for chicken"

 198;"494";"napkin-stand"

 199;"494";"heated stand"

 200;"494";"stands for cake"
 201;"1";"Appliances for peeling and cutting"

FIG. 168J

202;"201";"grater for vegetables"

 203;"305";"grater"

 204;"201";"garlic masher"

 205;"201";"egg cutter"

 206;"201";"Manual vegetable cutter"

 207;"201";"Peeler for vegetables"

 208;"201";"Nutcracker"

 209;"201";"The device for separating the yolks from the whites"

 210;"201";"grasping for carrots cleaning"

 211;"201";"scraper fish scales"

 212;"201";"cutter for fruits"

 213;"201";"oller for holes"

 214;"201";"tongs for fish bones"

 215;"201";"spiral vegetable cutter"

 216;"1";"Bottle Caps"

 217;"216";"champagne cork (stopper)"

 218;"216";"stoppers for wine"

 219;"216";"The opener to remove the crown corks from bottles"

 220;"1";"sieves"

 221;"220";"sieve for tea"

 222;"220";"sieve-tongs for tea"

 223;"220";"Strainer for spices"
 224;"220";"Strainer for tea"

FIG. 168K

225;"220";"Universal sieve"	249;"240";"dryer for cutlery"
226;"220";"flour sieve"	250;"240";"glass for cutlery"
228;"220";"The Chinese sieve with a mesh insert"	251;"240";"napkin for the cutlery"
229;"220";"sieve with support"	252;"240";"case for cutlery"
230;"220";"Mug-sieve for flour"	253;"240";"tray for cutlery"
231;"220";"sieve on the handle"	254;"240";"mitten-potholder"
232;"1";"Salt and pepper shakers"	255;"240";"box for cutlery"
233;"282";"container for seasoning"	256;"240";"full-size rack (cassette) for cutlery"
234;"232";"salt cellar"	257;"240";"Stand without containers for cutlery"
235;"232";"containers for oil and vinegar"	258;"240";"cassette for cutlery"
236;"1";"Dish dryers"	259;"240";"container for cutlery"
237;"236";"salad dryer"	260;"240";"station for cutlery"
238;"236";"dryer-placemat"	261;"240";"Shelf for cutlery"
239;"236";"dryer for crockery and cutlery"	262;"1";"Decorations for cocktails"
240;"1";"Cutlery Accessories"	263;"262";"ducts"
241;"240";"cutlery tray"	264;"262";"sticks"
242;"240";"cutlery holder"	266;"496";"molds for ice"
243;"240";"cutlery container"	267;"496";"molds for children"
244;"240";"strainer for cutlery"	268;"496";"Molds for shaping products"
245;"240";"wall hanger for kitchen tools"	269;"496";"Molds for dumplings"
246;"240";"cutlery organizer"	271;"497";"Measuring container"
247;"240";"mat for cutlery"	272;"497";"A mixing container with the dispenser"
248;"240";"sliding tray for cutlery"	273;"497";"Measuring container with the funnel"

FIG. 168L**FIG. 168M**

274;"497";"beaker"	298;"1";"railing with hooks"
275;"497";"scoop"	299;"1";"silicone mats"
276;"1";"kitchen scissors"	300;"299";"baking mat"
277;"276";"Scissors for BBQ"	301;"299";"mat for baking cakes"
278;"276";"Kitchen scissors with bottle opener"	302;"299";"mat for drying of the glasses"
279;"276";"Scissors for greens"	303;"299";"cooking mat"
280;"276";"Kitchen multipurpose scissors"	304;"299";"Mat for drying of the dishes"
281;"276";"Kitchen scissors for poultry"	305;"1";"graters presses rubbing machines"
282;"1";"utensil for storage"	306;"305";"grater with a handle"
283;"282";"container for storage"	308;"305";"multifunction grater"
284;"282";" Bottles for liquid spices oils"	309;"305";"grater shredder"
285;"282";"jars for storage"	310;"305";"grind for the green"
286;"282";"lunchbox"	311;"305";"grind for the garlic"
287;"282";"foldable lunchbox"	312;"305";"Slicer for tomatoes"
288;"282";"jar for hermetic storage of bulk products"	313;"305";"grater with rotating drums"
289;"282";"Sprayer for oil / vinegar"	314;"305";"universal device for grinding"
290;"282";"jar for bulk products"	315;"305";"mechanical grater"
291;"282";"containers for spices"	316;"305";"garlic peeling tube"
293;"282";"Container for tea"	317;"305";"rubbing machine"
294;"1";"potholders"	318;"305";"press for vegetables"
295;"294";"oven-glove"	319;"305";"press for garlic"
296;"294";"silicone potholders"	320;"305";"press for hamburgers"
297;"294";"dishcloth"	321;"1";"knife sharpener"

FIG. 168N**FIG. 168O**

322;"321";"electric sharpener"

323;"321";"sharpening stone"

324;"321";"ceramic sharpener"

325;"1";"breadbox"

326;"1";"lattice with legs"

327;"339";"Flatware"

328;"327";"for alcohol"

329;"540";"Cognac set with the batcher"

330;"540";"Glasses souvenir"

331;"540";"Glasses"

332;"540";"Bucket for ice"

333;"540";"Shot glasses"

334;"540";"Bucket for champagne"

335;"540";"Wine glasses"

336;"540";"decanter"

337;"540";"tray"

338;"540";"Support under a bottle"

339;"327";"tableware"

340;"339";"first course dish"

341;"339";"dish for bouillon"

342;"339";"bouillon bowl"

343;"339";"oiler"

344;"339";"round dish"

345;"339";"duck pan"

346;"339";"Set for making chocolate fondue"

347;"339";"Set for making cheese fondue"

348;"339";"salad bowl"

349;"339";"dish for cake"

350;"339";"compartmental dish"

351;"339";"set of cutlery"

352;"339";"serving spoon and fork"

353;"339";"dish with lid"

354;"339";"steam table"

355;"374";"ice-cream bowl"

357;"339";"saucer"

358;"339";"saucer for jam"

359;"339";"mustard-pot"

360;"339";"pepper-pot"

361;"339";"ash-pot"

362;"339";"deep table plate"

363;"339";"dinner plate"

364;"339";"snack plate"

365;"339";"deep dessert plate"

366;"339";"dessert plate"

367;"339";"plate for pies"

368;"339";"horseradish-pot"

369;"327";"Utensils for table"

FIG. 168P

FIG. 168Q

370;"369";"Pad for tableware"

371;"369";"serving mat"

372;"369";"serving tray"

373;"369";"glass burner"

374;"327";"Dishes for tea coffee desert"

375;"374";"sugar-bowl"

376;"374";"mug"

377;"374";"mug with teapot"

378;"374";"mug with stand"

379;"374";"mug with lid"

380;"374";"tea set"

381;"374";"dish"

382;"374";"french-press"

383;"374";"teapot"

384;"374";"teapot with strainer"

385;"374";"glass teapot"

387;"374";"multifunctional vase"

388;"540";"Glasses"

389;"374";"soup bowl"

390;"374";"wicker basket"

391;"374";"vase 3-tier"

393;"374";"napkin rings"

394;"374";"pannier for fruits"

FIG. 168R

395;"374";"table trash basket"

396;"374";"biscuit dish"

397;"374";"candy dish"

398;"374";"coffee sets"

399;"327";"CUTLERY"

437;"0";"Kitchen appliances"

438;"437";"aerogrill"

439;"437";"blenders grinder"

440;"437";"coffee Maker"

441;"437";"coffee grinder (coffee mill)"

442;"437";"Food Processor"

443;"437";"mixer"

444;"437";"mini oven"

445;"437";"multicooker"

446;"437";"meat grinders"

447;"437";"steamers"

448;"437";"Raclette grill"

449;"437";"Juicers"

450;"437";"toasters"

451;"437";"egg cooker"

452;"437";"electric range"

453;"437";"electric induction stove"

454;"437";"electric kettle"

455;"437";"thermopots"

456;"437";"bread makers"

FIG. 168S

457;"437";"microwaves"
 458;"437";"weights for kitchen"
 459;"437";"electric driers"
 461;"0";"Children's dishes"
 462;"461";"Children Sets for baking"
 463;"461";"Children cutlery"
 464;"461";"Children thermoses"
 465;"461";"Children Sets of dishes"
 488;"437";"deep fryer"
 491;"339";"baking sheet"
 494;"1";"stand and holders"
 495;"220";"sieve to form the "Bird's Nest""
 496;"1";"mold"
 497;"1";"Measuring container"
 498;"339";"pan"
 499;"339";"frying pan"
 500;"437";"Cookware for induction cookers"
 501;"437";"Juice cookers"
 502;"437";"Milk cooker"
 503;"437";"Covers / splash screens"
 504;"437";"Microwave cookware"
 505;"437";"Braziers roasters"
 506;"437";"Turk"

FIG. 168T

507;"437";"Dumpling (manti) cookers"
 508;"437";"Sets"
 509;"437";"Samovars"
 510;"437";"Kasans"
 511;"437";"Electric stove"
 512;"437";"Casseroles (pans)"
 513;"512";"casseroles (pans) with non-stick coating"
 514;"512";"aluminum casseroles (pans)"
 515;"512";"Stainless steel casseroles (pans)"
 516;"512";"Enameled casseroles (pans)"
 517;"512";"Teflon coated casseroles (pans)"
 518;"512";"Heat-proof glass casseroles (pans)"
 519;"512";"Ladles"
 520;"512";"Ceramic casseroles (pans)"
 521;"512";"Set of casseroles (pans)"
 522;"512";"Pressure cooker"
 523;"512";"Pan-steamer"
 524;"512";"casseroles for induction cookers"
 525;"512";"Pan-fryer"
 526;"512";"Cast iron casserole (pot)"
 527;"512";"Titanium casserole"
 528;"437";"Frying pans skillet"
 529;"528";"Frying pan with ceramic coating"
 530;"528";"Frying pans with non-stick coating"

FIG. 168U

531;"528";"Frying pan with removable handle"

532;"528";"Stewpots"

533;"528";"Frying pans for grill"

534;"528";"Wok"

535;"528";"Pancake pans"

536;"528";"Electric frying pans"

537;"528";"Cast iron skillet"

538;"528";"Multifunctional frying pan"

539;"528";"Titanium frying pan"

540;"437";"Drinkware"

541;"540";"Wine glasses"

542;"540";"Water glasses"

543;"540";"Beer glasses"

544;"540";"Kegs"

545;"540";"Carafes"

546;"540";"Decanters"

547;"540";"Jugs"

548;"540";"Shots"

549;"540";"Wine glasses for champagne"

550;"540";"Glasses for brandy / cognac"

551;"540";"Wine glasses for a cocktail / martini"

FIG. 168V**A Sample List of Cuisine**

1;"0";"Abkhaz"

2;"0";"Australian"

3;"0";"Austrian"

4;"0";"Azerbaijan"

5;"0";"Albanian"

6;"0";"Algerian"

7;"0";"American"

8;"0";"English"

9;"0";"Arabic"

10;"0";"Argentine"

11;"0";"Armenian"

12;"0";"Bashkir"

13;"0";"Belarusian"

14;"0";"Belgian"

15;"0";"Bulgarian"

16;"0";"Bosnian"

17;"0";"Brazilian"

18;"0";"Hungarian"

19;"0";"Venezuelan"

20;"0";"Vietnamese"

21;"0";"Greek"

FIG. 168W

22;"0";"Georgian"
 23;"0";"Danish"
 24;"0";"Jewish"
 25;"0";"Israeli"
 26;"0";"Indian"
 27;"0";"Indonesian"
 28;"0";"Jordanian"
 29;"0";"Iraqi"
 30;"0";"Iranian"
 31;"0";"Irish"
 32;"0";"Icelandic"
 33;"0";"Spanish"
 34;"0";"Italian"
 35;"0";"Cambodian"
 36;"0";"Canadian"
 37;"0";"Cypriot"
 38;"0";"Chinese"
 39;"0";"Colombian"
 40;"0";"Korean"
 41;"0";"Creole"
 42;"0";"Costa Rica"
 43;"0";"Latvian"
 44;"0";"Lebanese"
 45;"0";"Libyan"
 46;"0";"Lithuanian"
 47;"0";"Macedonian"
 48;"0";"Malaysian"
 49;"0";"Moroccan"
 50;"0";"Mexican"
 51;"0";"Moldavian"
 52;"0";"Mongolian"
 53;"0";"German"
 54;"0";"Dutch"
 55;"0";"New Zealand"

FIG. 168X

56;"0";"Norwegian"
 57;"0";"Ossetian"
 58;"0";"Pakistani"
 59;"0";"Palestinian"
 60;"0";"Panamanian"
 61;"0";"Peruvian"
 62;"0";"Polish"
 63;"0";"Portuguese"
 64;"0";"Romanian"
 65;"0";"Russian"
 66;"0";"Serbian"
 67;"0";"Singaporean"
 68;"0";"Syrian"
 69;"0";"Slovak"
 70;"0";"Slovenian"
 71;"0";"Thai"
 72;"0";"Tatar"
 73;"0";"Tibetan"
 74;"0";"Tunisian"
 75;"0";"Turkish"
 76;"0";"Turkmen"
 77;"0";"Ukrainian"
 78;"0";"Philippine"
 79;"0";"Finnish"
 80;"0";"French"
 81;"0";"Croatian"
 82;"0";"Montenegrin"
 83;"0";"Czech"
 84;"0";"Chilean"
 85;"0";"Chuvash"
 86;"0";"Chukotka"
 87;"0";"Swedish"
 88;"0";"Swiss"
 89;"0";"Scottish"

FIG. 168Y

90;"0";"Ecuadorian"
 91;"0";"Estonian"
 92;"0";"Japanese"
 93;"0";"Raw food diet"
 94;"0";"European"
 95;"0";"International"
 96;"0";"Multinational"
 97;"0";"Lean"
 98;"0";"Caucasian"
 99;"0";"Children"

FIG. 168Z

A Sample List of Sample Bases:

1;"0";"Meat and meat products"

2;"1";"Basturma"

3;"1";"Fat"

4;"1";"brisket cooked and smoked"

5;"1";"Hare"

6;"1";"leather duck"

7;"1";"Sausage"

8;"1";"Sausages"

9;"1";"Sausages "Hunting party""

10;"1";"Horsemeat"

11;"1";"Bones with bone marrow"

12;"1";"Roe"

13;"1";"Rabbit"

14;"1";"Meat"

15;"1";"Moosemeat"

16;"1";"Venison"

17;"1";"Liver"

18;"1";"Kidney"

19;"1";"Smoked ribs"

20;"1";"Salami"

21;"1";"Sausages"

22;"1";"Cervelat"

23;"1";"Sausages"

24;"1";"Hungarian smoked bacon"

25;"1";"bacon fat-tailed"

26;"1";"Steak"

27;"1";"ribeye steak"

28;"1";"Farce"

29;"1";"crocodile fillet"

30;"1";"Jamon"

31;"1";"Choriso (Spanish sausage)"

32;"1";"Skewers"

33;"1";"Sowbelly"

34;"1";"Deer tongue"

35;"1";"LAMB"

36;"35";"breast of lamb"

37;"35";"loin of lamb"

38;"35";"blade lamb"

39;"35";"veal brains"

40;"35";"mutton ham"

41;"35";"veal ham"

42;"35";"leg of lamb"

43;"35";"Heel muscle mutton"

44;"35";"lamb offal"

45;"35";"veal kidneys"

46;"35";"lamb chops"

47;"35";"gras cow"

48;"35";"veal heart"

49;"35";"lamb testicles"

50;"35";"VEAL"

51;"35";"veal cheeks"

52;"35";"minced lamb"

53;"35";"minced veal"

54;"35";"veal tail"

55;"35";"veal tongue"

56;"35";"eggs bullish"

57;"1";"BEEF"

58;"57";"beef brisket"

59;"57";""

60;"57";"beef (sirloin)"

61;"57";"beef on the
bone"62;"57";"beef eye
muscle"

63;"57";"legs of beef"

64;"57";"ham beef"

65;"57";"gras beef"

66;"57";"beef ribs"

67;"57";"beef heart"

68;"57";"minced beef"

69;"57";"tail beef"

70;"57";"beef tongue"

71;"1";"PORK"

72;"71";"bacon"

73;"71";"smoked bacon"

74;"71";"pork"

75;"71";"ham"

76;"71";"pork brisket"

FIG. 169A**FIG. 169B****FIG. 169C**

77;"71";"smoked pork belly"	102;"90";"smoked chicken"	127;"123";"Black Sea goby"
78;"71";"Pork Intestine"	103;"90";"grouse"	128;"123";"shrimp head"
79;"71";"legs of pork"	104;"90";"coot"	129;"123";"Butterfish"
80;"71";"boar ham"	105;"90";"duck leg"	130;"123";"scallops"
81;"71";"pork ham"	106;"90";"crow's feet"	131;"123";"dorado"
82;"71";"pork ribs"	107;"90";"chicken legs"	132;"123";"ruff"
83;"71";"knuckle of pork"	108;"90";"chicken ham"	133;"123";"caviar"
84;"71";"fat"	109;"90";"quail"	134;"123";"red caviar"
85;"71";"pork (pork neck or loin)"	110;"90";"gras chicken"	135;"123";"Tobiko caviar"
86;"71";"pork ears"	111;"90";"chicken giblets"	136;"123";"squid"
87;"71";"minced pork"	112;"90";"grouse"	137;"123";"flounder"
88;"71";"pig tail"	113;"90";"chicken hearts"	138;"123";"cuttlefish"
89;"71";"pork tongue"	114;"90";"duck"	139;"123";"carp"
90;"0";"Birds"	115;"90";"smoked duck"	140;"123";"sprat"
91;"90";"garshnep"	116;"90";"Pheasant"	141;"123";"smelt"
92;"90";"turkey breast"	117;"90";"minced chicken"	142;"123";"crab sticks"
93;"90";"chicken breast"	118;"90";"chicken fillet"	143;"123";"Shrimps"
94;"90";"chicken breast smoked"	119;"90";"foie gras"	144;"123";"King shrimps"
95;"90";"duck breast"	120;"90";"chicken"	145;"123";"Salad shrimps"
96;"90";"Goose"	121;"90";"chicken gutted"	146;"123";"Tiger prawn"
97;"90";"chicken ventricles"	122;"90";"neck duck"	147;"123";"Bream"
98;"90";"turkey"	123;"0";"FISH and SEAFOOD"	148;"123";"salmon"
99;"90";"turkey wings"	124;"123";"anchovies"	149;"123";"Smoked salmon"
100;"90";"chicken wings"	125;"123";"arctic char"	150;"123";"Mussels"
101;"90";"chicken"	126;"123";"mullet"	151;"123";"Mussels with shells"

FIG. 169D

FIG. 169E

FIG. 169F

152;"123";"Pollock"	178;"123";"sardines"	204;"123";"catfish fillets"
153;"123";"Molluscs"	179;"123";"herring"	205;"123";"fillet of carp"
154;"123";"Sea food"	180;"123";"salmon"	206;"123";"fish fillet"
155;"123";"Sea fish"	181;"123";"smoked salmon"	207;"123";"salmon fillet"
156;"123";"sole (fish)"	182;"123";"salted salmon"	208;"123";"salted herring fillets"
157;"123";"Crab meat"	183;"123";"seabass"	209;"123";"perch fillet"
158;"123";"Krill meat"	184;"123";"whitefish"	210;"123";"trout"
159;"123";"Burbot"	185;"123";"ramp"	211;"123";"smoked trout"
160;"123";"Frog legs"	186;"123";"mackerel"	212;"123";"Squid Ink"
161;"123";"Perch"	187;"123";"smoked mackerel"	213;"123";"cervical shrimp"
162;"123";"Lobster"	188;"123";"sheatfish"	214;"123";"cervical cancers"
163;"123";"cisco"	189;"123";"starlet"	215;"123";"sprats"
164;"123";"sturgeon"	190;"123";"walleye"	216;"123";"pike"
165;"123";"octopus"	191;"123";"Dried seaweed"	217;"0";"VEGETABLES"
166;"123";"baby octopus"	192;"123";"tilapia"	218;"217";"watermelon"
167;"123";"shrimp broth"	193;"123";"carp"	219;"217";"Artichokes"
168;"123";"halibut"	194;"123";"cod"	220;"217";"eggplant"
169;"123";"Pangasius"	195;"123";"Hot smoked cod"	221;"217";"yam"
169;"123";"cod liver oil"	196;"123";"black cod"	222;"217";"broccoli tops"
171;"123";"haddock"	197;"123";"tuna"	223;"217";"beet tops"
172;"123";"crayfish"	198;"123";"turbot"	224;"217";"broccoli"
173;"123";"dried crustaceans"	199;"123";"eel"	225;"217";"rutabaga"
174;"123";"Hot smoked fish"	200;"123";"smoked eel"	226;"217";"galangal"
175;"123";"red fish salted"	201;"123";"snails"	227;"217";"peas"
176;"123";"swordfish"	202;"123";"oysters"	228;"217";"pea sprouts"
177;"123";"saury"	203;"123";"white fish fillets"	229;"217";"pea pods"

FIG. 169G**FIG. 169H****FIG. 169I**

230;"217";"green peas"	256;"217";"red onion"	282;"217";"Turnip"
231;"217";"daikon"	257;"217";"dry onion"	283;"217";"beansprouts"
232;"217";"melon"	258;"217";"small onion"	284;"217";"beet"
233;"217";"Ginseng"	259;"217";"Shallots"	285;"217";"Asparagus"
234;"217";"Ginger"	260;"217";"cassava"	286;"217";"chopped tomatoes"
235;"217";"zucchini"	261;"217";"mini corn"	287;"217";"Sweet"
236;"217";"feces"	262;"217";"mini peppers"	288;"217";"Pumpkin"
237;"217";"cabbage"	263;"217";"mini-tomatoes"	289;"217";"green beans"
238;"217";"Brussels sprouts"	264;"217";"carrots"	290;"217";"Fennel"
239;"217";"sauerkraut"	265;"217";"cucumber"	291;"217";"physalis"
240;"217";"Chinese cabbage"	266;"217";"parsnips"	292;"217";"horseradish"
241;"217";"Cabbage"	267;"217";"squash"	293;"217";"zucchini"
242;"217";"Romanesco cabbage"	268;"217";"bell peppers"	294;"217";"garlic"
243;"217";"savoy cabbage"	269;"217";"cayenne pepper"	295;"217";"endive"
244;"217";"cauliflower"	270;"217";"fresh chili pepper"	296;"0";"FRUITS"
245;"217";"potatoes"	271;"217";"jalapeno peppers"	297;"296";"Apricot"
246;"217";"young potatoes"	272;"217";"tomato"	298;"296";"Avocado"
247;"217";"kohlrabi"	273;"217";"pickled tomatoes"	299;"296";"quince"
248;"217";"root anise"	274;"217";"cherry tomatoes"	300;"296";"fresh pineapple"
249;"217";"salsify root"	275;"217";"sunflower sprouts"	301;"296";"Orange"
250;"217";"parsley root"	276;"217";"wheat germ"	302;"296";"banana"
251;"217";"celery root"	277;"217";"soybean seedlings"	303;"296";"Hawthorn"
252;"217";"fresh corn"	278;"217";"germinated soybeans"	304;"296";"cranberries"
253;"217";"white onion"	279;"217";"rhubarb"	305;"296";"grapes"
254;"217";"pearl bow"	280;"217";"Radish"	306;"296";"Cherry"
255;"217";"onion"	281;"217";"wild radish"	307;"296";"Dried cherries"

FIG. 169J**FIG. 169K****FIG. 169L**

308;"296";"blueberries"	334;"296";"Pomelo"	360;"350";"raspberry jam"
309;"296";"Garnet"	335;"296";"Rowan"	361;"350";"fresh yeast"
310;"296";"Grapefruit"	336;"296";"drain"	362;"350";"gelatin"
311;"296";"pear"	337;"296";"red currants"	363;"350";"liquid Smokehouse"
312;"296";"Blackberry"	338;"296";"black currant"	364;"350";"sweetener"
313;"296";"strawberries"	339;"296";"tamarind"	365;"350";"corn muffins"
314;"296";"pomegranate seeds"	340;"296";"Feijoa"	366;"350";"ketchup"
315;"296";"carambola"	341;"296";"fruit to taste"	367;"350";"citric acid"
316;"296";"kiwi"	342;"296";"persimmon"	368;"350";"candy"
317;"296";"Strawberry"	343;"296";"cherries"	369;"350";"confiture"
318;"296";"Cranberry"	344;"296";"Cherry"	370;"350";"strawberry jam"
319;"296";"coconut"	345;"296";"blueberries"	371;"350";"food dye"
320;"296";"gooseberry"	346;"296";"apple"	372;"350";"starch"
321;"296";"kumquat"	347;"296";"frozen berries"	373;"350";"potato starch"
322;"296";"Lime"	348;"296";"juniper berries"	374;"350";"corn starch"
323;"296";"lemon"	349;"296";"fresh berries"	375;"350";"bread crumbs"
324;"296";"Litchi"	350;"0";"GROCERY"	376;"350";"Noodles"
325;"296";"raspberries"	351;"350";"agar"	377;"350";"buckwheat noodles"
326;"296";"mango"	352;"350";"adjika"	378;"350";"Pad Thai noodles"
327;"296";"Mandarin"	353;"350";"rice paper"	379;"350";"rice noodles"
328;"296";"Passionfruit"	354;"350";"vanilla extract"	380;"350";"glass noodles"
329;"296";"mini pineapple"	355;"350";"vermicelli rice"	381;"350";"noodles harusame"
330;"296";"Nectarine"	356;"350";"egg noodles"	382;"350";"egg noodles"
331;"296";"buckthorn"	357;"350";"algae"	383;"350";"mayonnaise"
332;"296";"papaya"	358;"350";"glucose"	384;"350";"poppy sweet"
333;"296";"Peach"	359;"350";"jam"	385;"350";"pasta"

FIG. 169M**FIG. 169N****FIG. 169O**

386;"350";"cannelloni pasta"
 387;"350";"pasta lumakoni"
 388;"350";"pasta feathers"
 389;"350";"fusilli pasta"
 390;"350";"pumpkin marmalade"
 391;"350";"jujube fruit"
 392;"350";"marzipan"
 393;"350";"mirin"
 394;"350";"coconut milk"
 395;"350";"almond milk"
 396;"350";"soy milk"
 397;"350";"muesli"
 398;"350";"Pasta"
 399;"350";"peanut paste"
 400;"350";"red curry paste"
 401;"350";"tamarind paste"
 402;"350";"Tom Yam Paste"
 403;"350";"chili paste"
 404;"350";"molasses"
 405;"350";"pectin"
 406;"350";"Penne"
 407;"350";"jam"
 408;"350";"elderberry syrup"
 409;"350";"vanilla syrup"
 410;"350";"syrup vishnevny"

FIG. 169P

411;"350";"ginger syrup"
 412;"350";"caramel syrup"
 413;"350";"maple syrup"
 414;"350";"strawberry syrup"
 415;"350";"coffee syrup"
 416;"350";"corn syrup"
 417;"350";"raspberry syrup"
 418;"350";"mango syrup"
 419;"350";"honey syrup"
 420;"350";"almond syrup"
 421;"350";"walnut syrup"
 422;"350";"blackcurrant syrup"
 423;"350";"chocolate syrup"
 424;"350";"cranberry sauce"
 425;"350";"worcestershire sauce"
 426;"350";"pomegranate sauce"
 427;"350";"kimchi sauce"
 428;"350";"pesto"
 429;"350";"fish sauce"
 430;"350";"fish sauce nam pla"
 431;"350";"Tabasco sauce"
 432;"350";"teriyaki sauce"
 433;"350";"sauce tkemali"
 434;"350";"oyster sauce"
 435;"350";"sweet chili sauce"

FIG. 169Q

436;"350";"Japanese walnut sauce"
 437;"350";"spaghetti"
 438;"350"; " ;"crumbs of white bread"
 439;"350";"breadcrumbs"
 440;"350";"pastry decorations"
 441;"350";"candied"
 442;"0";"MILK PRODUCTS and EGGS"
 443;"442";"yogurt"
 444;"442";"natural yoghurt"
 445;"442";"kefir"
 446;"442";"margarine"
 447;"442";"butter"
 448;"442";"melted butter"
 449;"442";"milk"
 450;"442";"baked milk"
 451;"442";"buttermilk"
 452;"442";"curdled"
 453;"442";"cream"
 454;"442";"sour cream"
 455;"442";"whey"
 456;"442";"Thane"
 457;"442";"curd"
 458;"442";"curd beaded"

FIG. 169R

459;"442";"quail eggs"
 460;"442";"egg"
 461;"0";"mushrooms"
 462;"461";"oyster mushrooms"
 463;"461";"
 464;"461";"ceps"
 465;"461";"Enoki mushrooms"
 466;"461";"Chinese dried mushrooms"
 467;"461";"portobello mushrooms"
 468;"461";"dried mushrooms"
 469;"461";"shiitake mushrooms"
 470;"461";"milk mushrooms"
 471;"461";"chanterelles"
 472;"461";"boletus"
 473;"461";"honey fungus"
 474;"461";"saffron milk cap"
 475;"461";"morels"
 476;"461";"truffles"
 477;"461";"meadow mushrooms"
 478;"0";"CHEESE"
 479;"478";"cheese"
 480;"478";"cheese Adyghe"
 481;"478";"brie cheese"
 482;"478";"feta cheese"

FIG. 169S

483;"478";"Burrata cheese"
 484;"478";"Gouda cheese"
 485;"478";"Dutch cheese"
 486;"478";"blue cheese"
 487;"478";"Gorgonzola"
 488;"478";" ;"grana padano cheese"
 489;"478";"Gruyere cheese"
 490;"478";" -";"Dor Blue cheese"
 491;"478";"Camembert"
 492;"478";"goat cheese"
 493;"478";"cheese sausage"
 494;"478";"mascarpone cheese"
 495;"478";"Monterey Jack cheese"
 496;"478";"mozzarella cheese"
 497;"478";"soft cheese"
 498;"478";"goat cheese"
 499;"478";"parmesan cheese"
 500;"478";"pecorino cheese"
 501;"478";"processed cheese"
 502;"478";"cheese Poshehonsky"
 503;"478";"ricotta cheese"

FIG. 169T

504;"478";"Roquefort cheese"
 505;"478";"blue cheese"
 506;"478";"cream cheese"
 507;"478";"suluguni"
 508;"478";"cheese curd"
 509;"478";"feta cheese"
 510;"478";"philadelphia cheese"
 511;"478";"cheddar cheese"
 512;"478";"edam cheese"
 513;"478";"Emmentaler cheese"
 514;"0";"NUTS and DRIED FRUITS"
 515;"514";"peanuts"
 516;"514";"barberry"
 517;"514";"walnuts (peeled)"
 518;"514";"raisins"
 519;"514";"figs"
 520;"514";"Chestnut"
 521;"514";"Dried cranberries"
 522;"514";"coconut"
 523;"514";"dried apricots"
 524;"514";"Filbert (hazelnut)"
 525;"514";"almonds"

FIG. 169U

526;"514";"nuts"	552;"537";"Bitter Brandy"	577;"537";"Puer tea in Mandarin"
527;"514";"pine nuts"	553;"537";"Rooibos"	578;"537";"oolong tea"
528;"514";"cashew nuts"	554;"537";"pineapple juice"	579;"537";"black tea"
529;"514";"Dried peaches"	555;"537";"orange juice"	580;"537";"Espresso"
530;"514";"sunflower seeds"	556;"537";"birch juice"	581;"0";"ALCOHOL"
531;"514";"pumpkin seeds"	557;"537";"grape juice"	582;"581";"Balm"
532;"514";"Dried Fruits"	558;"537";"cherry juice"	583;"581";"Bitter"
533;"514";"Dates"	559;"537";"pomegranate juice"	584;"581";"brandy"
534;"514";"pistachios"	560;"537";"strawberry juice"	585;"581";"bourbon"
535;"514";"hazelnuts"	561;"537";"cranberry juice"	586;"581";"vermouth"
536;"514";"prunes"	562;"537";"gooseberry juice"	587;"581";"wine"
537;"0";"BEVERAGES"	563;"537";"lime juice"	588;"581";"white wine"
538;"537";"water"	564;"537";"mango juice"	589;"581";"sparkling wine"
539;"537";"water orange"	565;"537";"tangerine juice"	590;"581";"red wine"
540;"537";"mineral water"	566;"537";"peach juice"	591;"581";"dry red wine"
541;"537";"water pink"	567;"537";"currant juice"	592;"581";"wine sangria"
542;"537";"GABA-tea"	568;"537";"tomato juice"	593;"581";"whiskey"
543;"537";"Hibiscus"	569;"537";"apple juice"	594;"581";"Vodka"
544;"537";"kvass"	570;"537";"sprite"	595;"581";"anise vodka"
545;"537";"bread kvass"	571;"537";"tonic"	596;"581";"grappa"
546;"537";"-;"Coke"	572;"537";"tea white"	597;"581";"gin"
547;"537";"Kuding"	573;"537";"tea yellow"	598;"581";"-;"Irish cream liqueur"
548;"537";"lemonade"	574;"537";"green tea"	599;"581";"Calvados"
549;"537";"mate"	575;"537";"red tea"	600;"581";"Cachaca"
550;"537";"juice"	576;"537";"Puer tea"	
551;"537";"carbonated drink"		

FIG. 169V**FIG. 169W****FIG. 169X**

601;"581";"brandy"
 602;"581";"liqueur"
 603;"581";"orange liqueur"
 604;"581";"coffee liqueur"
 605;"581";"chocolate liqueur"
 606;"581";"Madeira"
 607;"581";"Marsala"
 608;"581";"Martini"
 609;"581";"beer"
 610;"581";"cherry beer"
 611;"581";"port"
 612;"581";"rum"
 613;"581";"white rum"
 614;"581";"black rum"
 615;"581";"Sake"
 616;"581";"sambuca"
 617;"581";"cider"
 618;"581";"tequila"
 619;"581";"sherry"
 620;"581";"0";"Champagne (Brut)"
 621;"581";"schnapps"
 622;"0";"GREENS AND HERBS"
 623;"622";"basil"
 624;"622";"basil red"
 625;"622";"bouquet garni"

FIG. 169Y

626;"622";"oregano"
 627;"622";"greens"
 628;"622";"dried herbs"
 629;"622";"-";"cabbage pak choi"
 630;"622";"chervil"
 631;"622";"cilantro"
 632;"622";"oxalis"
 633;"622";"oat root"
 634;"622";"fresh coriander"
 635;"622";"nettle"
 636;"622";"Watercress"
 637;"622";"watercress"
 638;"622";"rose petals"
 639;"622";"lemongrass"
 640;"622";"bamboo leaves"
 641;"622";"banana leaves"
 642;"622";"grape leaves"
 643;"622";"Grape leaves (salty)"
 644;"622";"kaffir lime leaves"
 645;"622";"lime leaves"
 646;"622";"dandelion leaves"
 647;"622";"green onion"
 648;"622";"-";"Leek"
 649;"622";"marjoram"
 650;"622";"chard"
 651;"622";"melissa"

FIG. 169Z

652;"622";"lemon balm"
 653;"622";"Mint"
 654;"622";"oregano"
 655;"622";"parsley"
 656;"622";"dried parsley"
 657;"622";"plantain"
 658;"622";"wormwood"
 659;"622";"chopped
camomile"
 660;"622";"arugula"
 661;"622";"iceberg lettuce"
 662;"622";"green salad"
 663;"622";"corn salad"
 664;"622";"lettuce"
 665;"622";"leaf lettuce"
 666;"622";"salad Mizuno"
 667;"622";" : "Oakleaf lettuce"
 668;"622";"radicchio salad"
 669;"622";"romaine lettuce"
 670;"622";"salad Friess"
 671;"622";"salad mix"
 672;"622";"celery"
 673;"622";"Lemon grass
(lemon grass)"
 674;"622";"Italian herbs"
 675;"622";"spicy herbs"

FIG. 169Z1

676;"622";"dill"	701;"689";"cereal wheat"	726;"689";"buckwheat flakes"
677;"622";"dandelion flowers"	702;"689";"couscous"	727;"689";"cereal grains"
678;"622";"flowers"	703;"689";"flour"	728;"689";"oat flakes"
679;"622";"lavender flowers"	704;"689";"buckwheat flour"	729;"689";"lentils"
680;"622";"chicory"	705;"689";"chestnut flour"	730;"689";"barley"
681;"622";"thyme"	706;"689";"corn flour"	731;"0";"Spices and Seasonings"
682;"622";"Ramson"	707;"689";"almond flour"	732;"731";"star anise"
683;"622";"saffron"	708;"689";"Chickpea flour"	733;"731";"white pepper"
684;"622";"rosehips"	709;"689";"oat flour"	734;"731";"vanillin"
685;"622";"chives"	710;"689";"wheat flour"	735;"731";"vanilla"
686;"622";"spinach"	711;"689";"rye flour"	736;"731";"vanilla essence"
687;"622";"sorrel"	712;"689";"rice flour"	737;"731";"vanilla powder"
688;"622";"tarragon"	713;"689";"chickpeas"	738;"731";"wasabi"
689;"0";"Cereals legumes and flours"	714;"689";"bran"	739;"731";"caltrop"
690;"689";"beans"	715;"689";"millet"	740;"731";"garam masala"
691;"689";"mung beans"	716;"689";"Figure"	741;"731";"Carnation"
692;"689";"bulgur"	717;"689";"Figure baya"	742;"731";"cloves minced"
693;"689";"puffed rice"	718;"689";"basmati rice"	743;"731";"mustard"
694;"689";"buckwheat green"	719;"689";"brown rice"	744;"731";"sweet mustard"
695;"689";"Quinoa"	720;"689";"wild rice"	745;"731";"allspice peas"
696;"689";"buckwheat"	721;"689";"Round grain rice"	746;"731";"grain mustard"
697;"689";"corn grits"	722;"689";"semola (flour made from durum wheat)"	747;"731";"Cumin"
698;"689";"semolina"	723;"689";"Beans"	748;"731";"ground ginger"
699;"689";"oats"	724;"689";"white beans"	749;"731";"capers"
700;"689";"pearl barley"	725;"689";"red beans"	750;"731";"cardamom"
		751;"731";"curry"

FIG. 16922

FIG. 16923

FIG. 16924

752;"731";"coriander"	778;"731";"lean oil"	804;"731";"pink ground pepper"
753;"731";"ground coriander"	779;"731";"vegetable oil"	805;"731";"sugar"
754;"731";"cinnamon"	780;"731";"oil refined"	806;"731";"vanilla sugar"
755;"731";"coffee essence"	781;"731";"oil seed-bearing"	807;"731";"brown sugar"
756;"731";"balsamic cream"	782;"731";"soybean oil"	808;"731"; "sugar muskovado"
757;"731";"sesame"	783;"731";"truffle oil"	809;"731"; "sugar cane"
758;"731";"turmeric"	784;"731";"oil pumpkin"	810;"731";"powdered sugar"
759;"731";"bay leaf"	785;"731";"almonds hammers"	811;"731";"nasturtium seeds"
760;"731";"lemon pepper"	786;"731";"miso paste"	812;"731";"Nigella seeds"
761;"731";"poppy seed"	787;"731";"sea ??salt"	813;"731";"fennel seeds"
762;"731";"olives"	788;"731";"nutmeg"	814;"731";"","spice mix "taco"'"
763;"731";"olives dry"	789;"731";"olives"	815;"731";"Soda"
764;"731";"avocado oil"	790;"731";"Ligurian olives"	816;"731";"ginger juice squeezed"
765;"731";"anchovy butter"	791;"731";"hot red pepper"	817;"731";"lemon juice"
766;"731";"peanut oil"	792;"731";"hot peppers"	818;"731";"salt"
767;"731";"mustard oil"	793;"731";"fenugreek"	819;"731";"citrate"
768;"731";"oil for frying"	794;"731";"paprika"	820;"731";"grape sauce"
769;"731";"scented oil"	795;"731";"lemongrass paste"	821;"731";"sauce narsharab"
770;"731";"grapeseed oil"	796;"731";"peperoncini"	822;"731";"ponzu sauce"
771;"731";"canola oil"	797;"731";"pepper pink polka dots"	823;"731";"soy sauce"
772;"731";"corn oil"	798;"731";"chili"	824;"731";"tomato sauce"
773;"731";"sesame oil"	799;"731";"Dried chili peppers"	825;"731";"chili sauce"
774;"731";"linseed oil"	800;"731";"mustard powder"	826;"731";"Spices"
775;"731";"olive oil"	801;"731";"seasoning fish"	827;"731";"sumac"
776;"731";"Peanut butter"	802;"731";"baking powder"	828;"731";"thyme"
777;"731";"sunflower oil"	803;"731";"rosemary"	829;"731";"cumin"

FIG. 169Z5**FIG. 169Z6****FIG. 169Z7**

830;"731";"Mediterranean herbs"	856;"848";"biscuit"	882;"848";"crushed tomatoes in juice"
831;"731";"French herbs"	857;"848";"beans canned"	883;"848";"pickled ginger"
832;"731";"vinegar"	858;"848";"bun"	884;"848";"Cocoa"
833;"731";"balsamic vinegar"	859;"848";"buns for hamburgers"	885;"848";"marinated cactus"
834;"731";"wine vinegar"	860;"848";"broth"	886;"848";"Pickled capers"
835;"731";"white wine vinegar"	861;"848";"beef broth"	887;"848";"sour cabbage"
836;"731";"red wine vinegar"	862;"848";"chicken broth"	888;"848";"sea ??kale"
837;"731";"cherry vinegar"	863;"848";"fish broth"	889;"848";"Kimchi"
838;"731";"raspberry vinegar"	864;"848";"Jam"	890;"848";"wafer cakes"
839;"731";"rice vinegar"	865;"848";"Apricot jam"	891;"848";"gherkins"
840;"731";"apple cider vinegar"	866;"848";"lingonberry jam"	892;"848";"natural coffee"
841;"731";"-";"hops suneli"	867;"848";"cherry jam"	893;"848";"instant coffee"
842;"731";"Savory"	868;"848";"black currant jam"	894;"848";"crackers"
843;"731";"chutney"	869;"848";"raspberry jam"	895;"848";"Chocolate Crumb"
844;"731";"black pepper"	870;"848";"blueberry jam"	896;"848";"croissant"
845;"731";"black pepper peas"	871;"848";"Wafer"	897;"848";"bouillon cubes"
846;"731";"dry garlic"	872;"848";"canned cherry"	898;"848";"canned corn"
847;"731";"sage"	873;"848";"Glaze"	899;"848";"marinated corn"
848;"0";"PREPARED PRODUCTS"	874;"848";"Dijon mustard"	900;"848";"pita"
849;"848";"canned pineapple"	875;"848";"croutons"	901;"848";"lanspik"
850;"848";"canned artichokes"	876;"848";"marinated mushrooms"	902;"848";"ice"
851;"848";"Marinated artichokes"	877;"848";"Demiglas apple"	903;"848";"letcho"
852;"848";"baguette"	878;"848";"yeast"	904;"848";"lasagna sheets"
853;"848";"loaf"	879;"848";"Jelly"	905;"848";"canned salmon"
854;"848";"Bars of chocolate"	880;"848";"leaven"	906;"848";"pickled onions"
855;"848";"meringue"	881;"848";"marshmallows"	

FIG. 169Z8

FIG. 169Z9

FIG. 169Z10

907;"848";"canned mandarins"	932;"848";"frozen dumplings"	958;"848";"sorbet"
908;"848";"marshmallow"	933;"848";"hot pepper pickled"	959;"848";"barbecue sauce"
909;"848";"hazelnut oil"	934;"848";"canned peaches"	960;"848";"sauce bearnese"
910;"848";"sweet curd"	935;"848";"Cookies"	961;"848";"bechamel"
911;"848";"yoghurt"	936;"848";"Biscuit"	962;"848";"Worcestershire sauce"
912;"848";"honey"	937;"848";"Cookies Savoiardi"	963;"848";"sauce Demiglas"
913;"848";"honey in the comb"	938;"848";"chocolate cookies"	964;"848";" "
914;"848";"Mix ginger"	939;"848";"pita"	965;"848";"sweet and sour sauce"
915;"848";"condensed milk"	940;"848";"supplements"	966;"848";"salsa"
916;"848";"condensed milk boiled"	941;"848";"tomatoes in juice"	967;"848";"sweet sauce"
917;"848";"milk powder"	942;"848";"canned tomatoes"	968;"848";"chocolate sauce"
918;"848";"pickled carrots"	943;"848";"popcorn"	969;"848";"berry sauce"
919;"848";"ice cream"	944;"848";"prosciutto"	970;"848";"asparagus soya"
920;"848";"vanilla ice cream"	945;"848";"gingerbread"	971;"848";"caramel chips"
921;"848";"chocolate ice cream"	946;"848";"mango puree"	972;"848";"crushed crackers"
922;"848";"salted cucumber"	947;"848";"mashed potatoes"	973;"848";"tartlets"
923;"848";"pickled cucumbers"	948;"848";"tomato puree"	974;"848";"tahini"
924;"848";"pickled cucumbers"	949;"848";"apple puree"	975;"848";"pasta for lasagna"
925;"848";"pecans"	950;"848";"pickle cucumber"	976;"848";"dough for ravioli"
926;"848";"beet broth"	951;"848";"roll"	977;"848";"pizza dough"
927;"848";"corn sticks"	952;"848";"Pickled beets"	978;"848";"yeast dough"
928;"848";"bread sticks"	953;"848";"pork jerky"	979;"848";"dough kataifi"
929;"848";"tomato paste"	954;"848";"sugar syrup"	980;"848";"shortbread dough"
930;"848";"Pasta Chocolate"	955;"848";"whipped cream"	981;"848";"pastry dough"
931;"848";"pate"	956;"848";"cream of coconut"	982;"848";"puff pastry"
	957;"848";"malt"	983;"848";"dough dry"

FIG. 169Z11**FIG. 169Z12****FIG. 169Z13**

984;"848";"filo pastry"	1010;"848";"milk chocolate"
985;"848";"dried tomatoes"	1011;"848";"dark chocolate"
986;"848";"Tortilla"	1012;"50";"veal fillet"
987;"848";"toast"	1013;"57";"beef fillet"
988;"848";"tofu"	1014;"848";"sauce for soups "Bright udon""
989;"848";"tuna fish oil"	1015;"296";"Lemon"
990;"848";"tuna canned in its own juice"	1016;"217";"Carrots"
991;"848";"Tahini"	1017;"217";"Tomato"
992;"848";"Rice Stuffing"	
993;"848";"Canned beans"	
994;"848";"white bread"	
995;"848"; "toast bread"	
996;"848";"rye bread"	
997;"848";"sweet bread"	
998;"848";"black bread"	
999;"848";"rye bread"	
1000;"848";"corn flakes"	
1001;"848";"ciabatta"	
1002;"848";"tea Away"	
1003;"848";"potato chips"	
1004;"848";"corn chips"	
1005;"848";"Marinated mushrooms"	
1006;"848";"chocolate corn balls"	
1007;"848";"Chocolate"	
1008;"848";"white chocolate"	
1009;"848";"bitter chocolate"	

FIG. 169Z15**FIG. 169Z14**

Table D: Types of Cuisine and Food Dishes

	Types of Cuisine
1	Abkhaz cuisine
2	Australian cuisine
3	Austrian cuisine
4	Azerbaijan cuisine
5	Albanian cuisine
6	Algerian cuisine
7	American cuisine
8	English cuisine
9	Arabic cuisine
10	Argentine cuisine
11	Armenian cuisine
12	Bashkir cuisine
13	Belarusian cuisine
14	Belgian cuisine
15	Bulgarian cuisine
16	Bosnian cuisine
17	Brazilian cuisine
18	Hungarian cuisine
19	Venezuelan cuisine
20	Vietnamese cuisine
21	Greek cuisine
22	Georgian cuisine
23	Danish cuisine
24	Jewish cuisine
25	Israeli cuisine
26	Indian cuisine
27	Indonesian cuisine
28	Jordanian cuisine
29	Iraqi cuisine
30	Iranian cuisine
31	Irish cuisine
32	Icelandic cuisine
33	Spanish cuisine
34	Italian cuisine
35	Cambodian cuisine
36	Canadian cuisine
37	Cypriot cuisine
38	Chinese cuisine
39	Colombian cuisine
40	Korean cuisine
41	Creole cuisine
42	Costa Rica cuisine
43	Latvian cuisine

FIG. 170A

44	Lebanese cuisine
45	Libyan cuisine
46	Lithuanian cuisine
47	Macedonian cuisine
48	Malaysian cuisine
49	Moroccan cuisine
50	Mexican cuisine
51	Moldavian cuisine
52	Mongolian cuisine
53	German cuisine
54	Dutch cuisine
55	Zealand cuisine
56	Norwegian cuisine
57	Ossetian cuisine
58	Pakistani cuisine
59	Palestinian cuisine
60	Panamanian cuisine
61	Peruvian cuisine
62	Polish cuisine
63	Portuguese cuisine
64	Romanian cuisine
65	Russian cuisine
66	Serbian cuisine
67	Singaporean cuisine
68	Syrian cuisine
69	Slovak cuisine
70	Slovenian cuisine
71	Thai cuisine
72	Tatar cuisine
73	Tibetan cuisine
74	Tunisian cuisine
75	Turkish cuisine
76	Turkmen cuisine
77	Ukrainian cuisine
78	Philippine cuisine
79	Finnish cuisine
80	French cuisine
81	Croatian cuisine
82	Montenegrin cuisine
83	Czech cuisine
84	Chilean cuisine
85	Chuvash cuisine
86	Chukotka cuisine
87	Swedish cuisine
88	Swiss cuisine
89	Scottish cuisine
90	Ecuadorian cuisine
91	Estonian cuisine

FIG. 170B

92	Japanese cuisine
93	Raw food diet
94	Estonian cuisine
95	Japanese cuisine
96	Raw food diet

	1	Types of Food Dishes
	1	Snacks
	2	Salads
	3	Entrees
	4	Main Dishes
	5	Desserts
	6	Drinks
	7	Sauces and marinades
	8	Baking
	9	Semi manufactures and preservatives

FIG. 170C**Table E: List of Robotic Food Preparation System (One Embodiment)**

No	Category	Sys Category	System	Responsible Party(s)	Major Challenges	Level of Completi on	Notes
01	Hardware	Robot	Hands		Productization, Robustness, Cost, Weight		
02	Hardware	Robot	Arms				
03	Hardware	Robot	Armature Rails				
04	Hardware	Capture/T raining	Dynamic 3D Vision System				
05	Hardware	Capture/T raining	Data Input				
06	Hardware	Capture/T raining	Editing System				
07	Hardware	Kitchen Module	Cabinets				
08	Hardware	Kitchen Module	Fixtures				
09	Hardware	Kitchen Module	Lighting with ability to computer-operating mode				
10	Hardware	Kitchen Module	Protection/Safety Screen with ability to computer- operating mode				

FIG. 171A

11	Hardware	Kitchen Module	Appliances				
12	Hardware	Kitchen Module	Automatic Storage device with ability to computer-operating mode				
13	Hardware	Kitchen Module	Automatic modular dispenser for flowing, liquid ingredients and water with ability to computer-operating mode				
	Hardware	Kitchen Module	Freshness ingredients analytical device				
	Hardware	Kitchen Module	Built-in electronic scales (in the tabletop) with ability to computer-operating mode				
14	Hardware	Kitchen Module	Cleaning				
15	Hardware	Kitchen Module	Waste Disposal				
	Hardware	Kitchen Module	Multi-functional professional steam-oven with ability to computer-operating mode				
	Hardware	Kitchen Module	Multi-functional professional kitchen processor with ability to computer-operating mode				
	Hardware	Kitchen Module	Top-loaded dishwasher with ability to computer-operating mode				
	Hardware	Kitchen Module	Professional Stove with turning control regulators/buttons operated with ability to computer-operating mode				
	Hardware	Kitchen Module	Standard dimension layout				
	Hardware	Kitchen Module	Anti-wieting, smoke, steam ventilation system autonomous or be connected to the duct with ability to computer-operating mode				
	Hardware	Kitchen Module	Kitchen sink with tap with ability to computer-operating mode				

FIG. 171B

16	Hardware	Control/Power Modules	CPU				
17	Hardware	Control/Power Modules	I/O Touchscreen				
18	Hardware	Control/Power Modules	Power Supply				
19	Hardware	Accessories	Utensils				
20	Hardware	Accessories	Food Containers/Cartridges				
21	Software	Robot Module	OS				
	Hardware	Kitchen Module	Professional Stove with turning control regulators/buttons operated with ability to computer-operating mode				
21	Software	Robot Module	OS				
22	Software	Robot Module	Apps				
23	Software	Robot Module	hand firmware				
24	Software	Robot Module	Arm firmware				
25	Software	Robot Module	Rail Control				
26	Software	Capture/Training	OS				
27	Software	Capture/Training	apps				
28	Software	Capture/Training	Vision				
29	Software	Capture/Training	Data Input				
30	Software	Capture/Training	Editing System				
31	Software	Kitchen Module	OS				
32	Software	Kitchen Module	App				

FIG. 171C

33	Software	Kitchen Module	Controller Protection/Safety				
34	Software	Kitchen Module	Controller, Appliances				
35	Software	Kitchen Module	Controller, Storage				
36	Software	Kitchen Module	Controller, Cleaning				
36	Software	Kitchen Module	Controller, Steam-oven				
36	Software	Kitchen Module	Controller, Kitchen Processor				
36	Software	Kitchen Module	Controller, Dishwasher				
36	Software	Kitchen Module	Controller, Stove				
36	Software	Kitchen Module	Controller, Ventilation system				
36	Software	Kitchen Module	Controller, Lighting				
37	Software	Kitchen Module	Controller, Waste				
37	Software	Kitchen Module	Controller, Tap				
37	Software	Kitchen Module	Controller, Dispensing device				
37	Software	Kitchen Module	Controller, Scales				
37	Software	Kitchen Module	Controller, Freshness Indicator				
38	Software	Control/Power Modules	OS				
39	Software	Control/Power Modules	I/O Touchscreen				
40	Software	Control/Power Modules	Control Apps				
41	Other	Food	Food Recipe Development				
42	Other	Food	Food Container Prep				
43	Other	Food	Food Order/Delivery				
44	Other	Logistics	Safety/Regulatory				
45	Other	Logistics	Sales/Distribution				

FIG. 171D

46	Other	Logistics	Installation/Maintenance				
47	Other	Logistics	Packaging/Shipping Container				
48	Other	Logistics	Return Management				
49	Other	Logistics	Technical Training				
50	Other	Logistics	Manuals				
51	Other	Logistics	Warranty				
52	Production	Robot					
53	Production	Kitchen Module					
54	Production	Integration / Shipping					
55	Production						
56	Production						
57	Production						
58	Production						
59	Production						
60	Production						

FIG. 171E

Types of functional results:	Functional result	minimanipulations	Parameters (variables)
	Robot making sushi		
		Taking exact amount of rice from container	1.XYZ position and orientation of container with rice 2. Position rice in the container (temporary library non-standardized objects) 3.Amount of rice you need to take, according Creator captured or entered information 4.Time of starting, according Creator timeline 5. Time of ending, according Creator timeline
		Making sufficient for sushi piece of rice by pressing out by fingers	1.Size of piece according initial size made by Creator 2.Shape of piece according initial size made by Creator 3.Position XYZ and orientation where we need to place it 4. Fingers pressure to making piece of rice according Creator initial pressure 5.Time of starting, according Creator timeline 6. Time of ending, according Creator timeline
		Take the whole piece of fish filet from container	1.XYZ position and orientation of container with fish filet 2. Shape of fish filet (temporary non-standardized object library)in container 3. Size of fish filet (temporary non-standardized object library) in container. 4. XYZ position and orientation of fish filet in container. 5. XYZ position and orientation, where we need to put the fish filet 6.Time of starting, according Creator timeline 7. Time of ending, according Creator timeline
		Cut sufficient for sushi piece of fish by knife of by special device.	2. Shape of fish filet (temporary non-standardized object library) 3. Size of fish filet (temporary non-standardized object library) 4. XYZ position and orientation of fish filet on operating place. 5.defined by initial Creator cooking thickness of current required piece 6. cutting angle, taking from initial Creator cooking process 7.Time of starting, according Creator timeline 8. Time of ending, according Creator timeline

FIG. 172A

		Put exact amount of wasabi on the top of piece of rice	1.XYZ position and orientation of container with pre-measured wasabi pieces 2. XYZ position and orientation of targeted wasabi piece (temporary non-standardized object library). 3. XYZ position where we need to put the wasabi piece according the shape of piece of rice and Creator place choice 3. Pressure of pushing wasabi in piece of rice according Creator initial pressure 4.Time of starting, according Creator timeline 5. Time of ending, according Creator timeline
		Put piece of fish on the top of piece of rice in sufficient way	1.XYZ position and orientation of catted piece of fish 2. XYZ position and orientation of prepared piece of rice 3. XYZ position and orientation where we need to place cut piece of fish 4.Time of starting, according Creator timeline 5. Time of ending, according Creator timeline
		Press out the sushi by fingers	1.XYZ position and orientation of piece of rice with fish on the top 2. Pressure of pinch according of Creator initial pinch 3.Time of starting, according Creator timeline 4. Time of ending, according Creator timeline
	Robot playing piano musical composition		
		Successfully press keys according playing technique 1... n by right hand	1.Time each finger pressing starting and ending period 2. Define the number of pressing techniques 3.Assign each finger to exact key number
		Successfully press keys according playing technique 1... n by left hand	1.Time each finger pressing starting and ending period 2. Define the number of pressing techniques 3.Assign each finger to exact key number
		Successfully press pedal piano by feet	1.Time each feet pressing starting and ending period 2. The number of pressing techniques 3. Assigning each feet to sufficient pedal
		Moving the body according Creator motion	1.XYZ initial body position 2. XYZ ending body position 3. Time of starting motion 4. Time of ending motion

FIG. 172B

	Robot moving by walking from A-position to B-position.	Making walking step by right leg	1.Speed (starting and ending time) 2.XYZ initial and target position 3. Height of leg raising depends of any barriers on the way 4. Type of stepping technique
		Making walking step by left leg	1.Speed (starting and ending time) 2.XYZ initial and target position 3. Height of leg raising depends of any barriers on the way 4. Type of stepping technique
	Robot moving by running from A to B position	Making running step by right leg	1.Speed (starting and ending time) 2.XYZ initial and target position 3. Height of leg raising depends of any barriers on the way 4. Type of stepping technique
		Making running step by left leg	1.Speed (starting and ending time) 2.XYZ initial and target position 3. Height of leg raising depends of any barriers on the way 4. Type of stepping technique
	Robot jumping from A to B position		
	Robot taking particular book from shelf		
	Robot bringing bag form A position to B position		
	Robot opening the jar		
	Putting food in a bowl for a cat		

FIG. 172C

Manipulation – REGULAR

Manipulation	1 st level	2 nd level
Measurement		
	Measurement of body temperature	
		Basal body temperature (observable entity)
		Breast temperature (observable entity)
		Axillary temperature (observable entity)
		Bladder temperature (observable entity)
		Groin temperature (observable entity)
		Nasopharyngeal temperature (observable entity)
		Oral temperature (observable entity)
		Rectal temperature (observable entity)
		Temperature of esophagus (observable entity)
		Temperature of vagina (observable entity)
		Tympanic temperature (observable entity)
		Joint temperature (observable entity)
		Temperature of digit (observable entity)
		Temperature of pinna (observable entity)
		Temperature of skin (observable entity)
	Measurement of Blood pressure	
	Measurement of heart rate	
	Measurement of respiratory rate	
	Measurements of a body	
		Growth
		Weight
		head circumference
		chest circumference
		hip circumference
Lavage		
	Gastric lavage	
		Gastric lavage with instillation of therapeutic substance
		Gastric lavage with water
		Nasogastric irrigation
	Irrigation of bowel	
	Irrigation of bowel	
	Irrigation of colon	
	Irrigation of colon via cecostomy tube	
	Rectal irrigation	
	Rectal stump washout via rectum	
	Rectal stump washout via stoma	
	Irrigation of gastrostomy	

FIG. 173A

	Irrigation of nasoenteral probe
	Irrigation of nasogastric probe
	Irrigation of ear
	Syringing ear to remove wax
	Irrigation of eye
	Irrigation of nasal passages
	Displacement therapy of nose, Proetz type
	Irrigation of nasal sinus
	Aspiration and lavage of nasal sinus by puncture
	Displacement therapy of nose, Proetz type
	Irrigation by cannulation of sphenoid sinus
	Irrigation of maxillary antrum
	Irrigation by cannulation of maxillary sinus
	Nasal sinus puncture and irrigation
	pharynx Irrigation
	Irrigation of ureteral catheter
	Irrigation of indwelling urinary catheter
	Irrigation of ureterostomy and ureteral catheter
	Irrigation of ureterostomy
	Irrigation of ureterostomy and ureteral catheter
	Irrigation of urethra
	Irrigation of urinary bladder
	Irrigation of cystostomy
	Manual bladder washout through catheter
	Urethral irrigation of bladder
	Stoma irrigation
	Irrigation of enterostomy
Supplemental oxygen	
Maintenance of body temperature	
	Active rewarming of the hypothermic patient
	Cooling - control body temperature
Catheterization	
	Catheterization of nasal sinus
	Catheterization of ureter
	Cystoscopic catheterization of ureter
	Cystostomy with insertion of ureteral catheter
	Retrograde catheterization of ureter
	Catheterization of urinary bladder
	Bladder catheter - diagnostic
	Urethral catheterization for urodynamics
	Catheterization of bladder by indwelling suprapubic catheter
	Complicated catheterization of bladder
	Cystostomy and insertion of suprapubic catheter

FIG. 173B

	Insertion of indwelling catheter into urinary bladder
	Insertion of suprapubic catheter using ultrasound guidance
	Residual catheterization
	Insertion of catheter into esophagus, permanent tube type
	Insertion of chronic ambulatory peritoneal dialysis catheter
	Insertion of dialysis catheter using doppler ultrasound guidance
	Insertion of nontunneled hemodialysis catheter
	Insertion of urethral catheter
	Insertion of indwelling urethral catheter
	Insertion of urethral catheter using guide wire
	Intermittent urethral catheterization
	Clean intermittent self-catheterization
	Urethral catheterization for urodynamics
	Insertion of vascular catheter
	Catheterization of vein
	Catheterization of brachial vein
	Catheterization of neck vein
	Jugular vein catheterization
	Catheterization of external jugular vein
	Catheterization of subclavian vein
	Catheterization of vein of lower limb
	Catheterization of vein of upper limb
	Central venous cannula insertion
	Central venous cannula insertion via antecubital fossa vein
	Central venous cannula insertion via axillary vein
	Central venous cannula insertion via femoral vein
	Central venous cannula insertion via jugular vein
	Central venous cannula insertion via external jugular vein
	Central venous cannula insertion via long saphenous vein
	Central venous cannula insertion via subclavian vein
	Insertion of subclavian feeding line
	Central venous cannula insertion via umbilical vein
	Insertion of catheter for central venous pressure monitoring
	Insertion of central venous catheter using doppler ultrasound guidance
	Insertion of cuffed central venous catheter
	Insertion of nontunneled central venous catheter
	Insertion of peripherally inserted central catheter
	Insertion of peripherally inserted central catheter using fluoroscopic guidance
	Percutaneous transluminal insertion of peripherally inserted central catheter
	Insertion of tunneled venous catheter
	Reinsertion of tunneled central venous catheter
	Insertion of catheter with venous sampling
	Bilateral insertion of catheter with bilateral venous sampling
	Intravenous insertion

FIG. 173C

	Venous catheterization for renal dialysis
	Insertion of catheter into artery
	Introduction of catheter, retrograde, brachial artery
	Introduction of catheter into carotid artery
	Umbilical artery cannula insertion
	Adjustment of chronic ambulatory peritoneal dialysis catheter
	Aspiration of chronic ambulatory peritoneal dialysis catheter
	Flushing of chronic ambulatory peritoneal dialysis catheter
	Insertion of chronic ambulatory peritoneal dialysis catheter
	Removal of chronic ambulatory peritoneal dialysis catheter
	Renewal of chronic ambulatory peritoneal dialysis catheter
	Insertion of peritoneal dialysis catheter using fluoroscopy guidance
	Insertion of temporary peritoneal dialysis catheter
	Laparoscopic insertion of peritoneal dialysis catheter
	Peritoneal dialysis catheter procedure using fluoroscopic guidance
	Removal of peritoneal dialysis catheter
	Removal of chronic ambulatory peritoneal dialysis catheter
	Replacement of peritoneal dialysis catheter
	Renewal of chronic ambulatory peritoneal dialysis catheter
	Shaving of peritoneal dialysis catheter cuff
	Repositioning of Tenckhoff catheter
	Venous catheter care
	Care of central venous catheter
	Care of tunneled central venous catheter
Physiotherapy	
	massage
	passive mobilization
	Continuous passive mobilization of ankle
	Continuous passive mobilization of elbow
	Continuous passive mobilization of fingers
	Continuous passive mobilization of hip
	Continuous passive mobilization of knee
	Continuous passive mobilization of shoulder
	Continuous passive mobilization of wrist
	Exercises for paralysis
	Exercises for rigidity
	Exercises for spasticity
	Physical exercises
	Active exercise
	Assisting exercise
	Muscle strength exercise
	Relaxation exercise
	Physical medicine ultrasound treatment

FIG. 173D

	Physical rehabilitation therapy procedure
	Care of stump technique
	Control of phantom sensation technique
	Protection of stump technique
	Cerebral palsy rehabilitation
	Doffing lower limb prosthesis practice
	Donning lower limb prosthesis practice
	Functional rehabilitation
	Gait evaluation
	Locomotor training
	Transfers with patient participation
	Lower limb amputee transfer practice
	Wheelchair transfer practice
	Walking practice
	Walking with patient - mobilization
	Weight transfer practice
	Joint disease rehabilitation
	Physical medicine initial examination and planning for rehabilitation program
	Sensorimotor techniques
	Biomechanical therapeutic activity
	Biomechanical remedial activity
	Body mechanics promotion
	Range of motion activity
	Lower limb activities
	Range of motion exercise
	Upper limb activities
	Motor retraining technique
	Neurodevelopmental techniques
	Developmental therapy
	Movement facilitation
	Activity for ontogenetic motor pattern
	Kinetic activities for coordination
	Kinetic activities for range of motion
	Kinetic activities for strengthening
	Movement experience
	Neurological functional rehabilitation
	Neuromuscular stimulation

FIG. 173E

		Reciprocal arm movements
		Reflex inhibition
		Reflex inhibiting patterning
		Reflex inhibiting posture
		Rhythmic stabilization
		Rhythmical bouncing
		Trunk elongation
		Weight transference - neurological
		Weight-bearing - neurological
		Weight-bearing through affected side
		Play therapy
		Competitive games psychotherapy
		Group trust experience games
		Minor group games for therapy
		Minor team games for therapy
		Pair activity games for therapy
		Relay games for therapy
		Team games for therapy
hygienic procedures		
		Assisting with mouthcare
		Assisting with personal grooming
		Assistance with shaving
		Assisting with haircare
		Assistance with hair styling
		Assistance with washing hair
		Assisting with nail care
		Self-care assistance: bathing/hygiene
		Assisting with toileting
		Give bedpan, remove and clean
		Give urinal, remove and clean
		Placing a patient on a bedpan

FIG. 173F

	Rectal tube insertion
feeding	
	Bottle feeding of patient
	Fluid intake encouragement
	Food intake encouragement
	Forced feeding of patient
	Intravenous feeding of patient
	Parenteral alimentation procedure
	Central line feeding
	Prolonged intravenous feeding
	Peripheral line feeding
	Total parenteral nutrition
	Mealtime assistance
	Nil by mouth
	Re-introduction of fiber
	Routine feeding of patient
	Self-care assistance: feeding
Sampling for analyses	
	blood sampling
	urine sampling
	scraping
	stool sampling
	smear sampling
Care of stoma and catheters	
	Assessment of stoma self care
	Assessment of cathether self care
Care of a wound	
	Application of pressure to wound
	Change of wound pack
	Chemical cauterization of wound
	Cleaning wound
	Dressing of wound

FIG. 173G

	Exploration of wound
	Gluing of wound
	Glue closure of skin wound
	Immobilization of wound
	Irrigation of wound
	Closure of skin wound by tape
	Shave debridement of skin wound
	Wound care
	Closed drainage wound care
	Post-surgical wound care
	Special care of wound
	Wound infiltration
	Wound infiltration of local anesthetic
Methods of administering drugs	
	Oral
	parenterally (injections)
	Subcutaneously
	Intramuscularly
	intra-arterial
	intravenously (dropper)
	intravenously (bolus)
	inhaler (or puffer)
	per rectum
	vaginal (pessary)
	sublingual
	intra-nasal
	eye drops
	ear drops
	topical skin cream
	nebuliser
	Installation of dropper

FIG. 173H

		arm
		leg
		subclavicular vein
	intramuscular injection execution	
		buttock
		thigh
		arm
		other
	subcutaneous injection execution	
		shoulder
		thigh
		subscapular
		abdomen
	"per os" drug administration	
	ointment applying	
	Eye drops instillation	
		eye
		ear
	general anaesthetic	
	local anaesthetic	
	regional block	
	nerve block	
	entonox	
	sedation	

FIG. 173I

Manipulation – EMERGENCY

Manipulation	1 st level	2 nd level
Intubation		
Resuscitation/cardiopulmonary resuscitation		
	Cardiac reanimation	
	Chest compressions	
	Defibrillation/pacing	
		- defibrillation
		- external pacing
	Artificial respiration	
	Artificial respiration	
	Continuous positive airways pressure/nasal intermittent positive pressure ventilation/bag valve mask	
	Nasal airway	
	Oral airway	
replenishment of blood loss		
	blood transfusion	
	Transfusion of blood components	
	Saline infusion	
Hemostasis		
	Rainey clips	
	Tourniquet	
	Bandage	
	injection hemostasis	
	Suture	
Emergency manipulation on trachea		
	Tracheostomy	
	cricothyrotomy	
Fracture of bone		
	Immobilization	
	Splinting	
	Fracture review	
	Joint aspiration	
	Plaster of Paris	
		application Plaster of Paris
		removal Plaster of Paris
Wound closure (excluding sutures)		
	Steri-Strips	
	wound glue	
	other (e.g. clips)	

FIG. 174

Equipment List

Equipment		
	CPAP / BIPAP	
		Chin Restraint
		CPAP water chambers
		CPAP humidifiers
		CPAP mask pads
	Oxygen Concentrator	
		Oxygen Cylinders
	Compressor Nebulizer System	
	Willchair	
	Apnea Monitors	
	Ventilators	
	Monitor	
	defibrillator	
	pulseoxymeter	
	Ambu's bag	
	tonometer	
	thermometer	
	irrigator	
Expendables		
	Test tubes	
	Syringes	
	Catheter urethral	
	nteric feeding tube	
	Bed Pan	
	Tube rectal	
	Infusional system	
	Needle	
	Catheter intravenous	
	urinal	
	ostomy pouching system	
	Catheter aspiration	
	Tube for an intubation	
	bandage	
	plait	
	dressing	
Medication		
	morphine	
	adrenaline	
	atropine	
	physical solution	

FIG. 175

Nursery Service - Manipulation Guide

Manipulation	minimanipulations
Intramuscular injection (in the buttock)	
-Preparation for manipulation:	
	1. help the patient to adopt the necessary position.
	2. remove the clothing at the injection site
	3. treat your hands with untiseptic solution
-Guidelines	
	1. Define a place (XYZ coordinates and shape) of insertion of a needle
	2. Treat the place by untiseptic from the center to the periphery (or from bottom to up) a large area of skin
	3. Treat by untiseptic the puncture site
	4. Open the steril syringe pack
	5. Wipe by untiseptic the top of the ampule or vial.
	6. Open the ampule or vial.
	7. Take the necessary amount of drug into the syringe
	8. Take the syringe in a right hand
	9. Shift the skin using the left hand over the injection site
	10. Insert a needle with exact power into the muscle at 90 degrees to a predetermined depth.
	11. Move your left robotic hand on the plunger and push gently (inject the drug into a muscle).
	12. Press the antiseptic wipes to the injection site and quickly withdraw the needle.
	13. Discard syringe and materials to the waste container
Intravenous injection - jet injection (subcutaneous veins of the anterior surface of the forearm and elbow)	
-Preparation for manipulation:	
	1. help the patient to adopt the necessary position.
	2. remove the clothing at the injection site
	3. treat the robotics hands with antiseptic
-Guidelines	
	1. Open the steril syringe pack
	2. Wipe by untiseptic the top of the ampule or vial.
	3. Open the ampule or vial.
	4. Take the necessary amount of drug into the syringe
	5. Put on the gloves on the robotic hands
	6. Apply venous tourniquet on the middle third of the shoulder through the disposable diaper or napkin (or clothes).
	7. Ask the patient to stretch and relax the fist for a few times.
	8. Find and palpate the most accessible and filled vein (select vein for injection).
	9. Treat from the center to the periphery (or from bottom to up) a large area of skin with the first ball,
	10. Ask the patient to make a fist

FIG. 176A

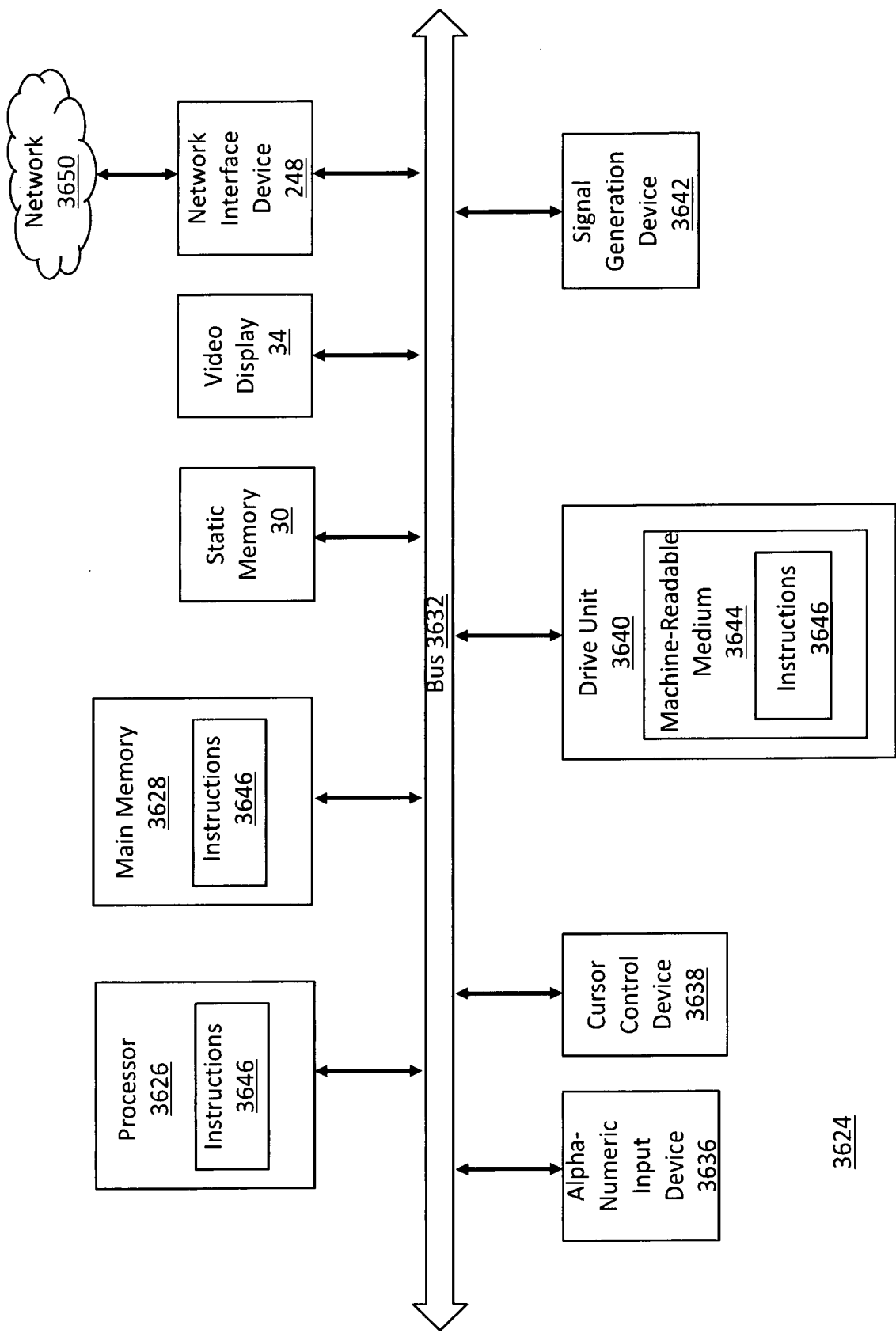
	11. Treat the injection site with the antiseptic wipes
	12. Shift the elbow skin (using the left thumb), fixing the vein
	13. Take the syringe in the right hand, holding the index finger on the cannula needle, place the needle parallelly to the surface, gently (with power X) pierce the skin and vein (simultaneously or successively) and slide 1/3 length of the needle to feel the "falling into the void", or the appearance of blood in the cannula and the syringe barrel;
	14. Pull the plunger and ensure that the blood appeared in the syringe barrel;
	15. Untie the tourniquet by pulling one of the ends.
	16. Ask the patient to unclench his fist.
	17. Pull the plunger to check the needle contact with a vein.
	18. Gently push the plunger (Inject the drug), without changing the position of the syringe
	19. Apply the antiseptic wipes to the injection site and remove the needle from the vein
	20. Ask the patient to bend the arm, leaving the ball at the puncture site to stop bleeding
	21. Discard syringe and materials to the waste container
Defibrillation	
-Equipment:	
	Defibrillator
-Guidelines	
	1. Place the patient on his back on a surface
	2. Open the chest surface
	3. Prepare the chest surface to the attachment of the electrodes
	4. Turn on the power.
	5. Place the first electrode over an area of cardiac dullness (women - outwards from the apex of the heart, beyond the breast)
	6. Place the second electrode under the right clavicle (at the right edge of the sternum directly below the clavicle), and if it is the dorsal electrode, then under the left scapula.
	7. Do not touch the patient and equipment
	8. Wait for completion of the ECG and the information about the need to discharge
	9. Determine the readiness of equipment for electric discharge
	10. Do not touch the patient
	11. Push on "discharge" button after the defibrillator is ready
	12. Open the chest surface

FIG. 176B

Equipment List

Equipment		
	CPAP / BIPAP	
		Chin Restraint
		CPAP water chambers
		CPAP humidifiers
		CPAP mask pads
	Oxygen Concentrator	
		Oxygen Cylinders
	Compressor Nebulizer System	
	Willchair	
	Apnea Monitors	
	Ventilators	
	Monitor	
	defibrillator	
	pulseoxymeter	
	Ambu's bag	
	tonometer	
	thermometer	
	irrigator	
Expendables		
	Test tubes	
	Syringes	
	Catheter urethral	
	nteric feeding tube	
	Bed Pan	
	Tube rectal	
	Infusional system	
	Needle	
	Catheter intravenous	
	urinal	
	ostomy pouching system	
	Catheter aspiration	
	Tube for an intubation	
	bandage	
	plait	
	dressing	
Medication		
	morphine	
	adrenaline	
	atropine	
	physical solution	

FIG. 177



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FIG. 178