

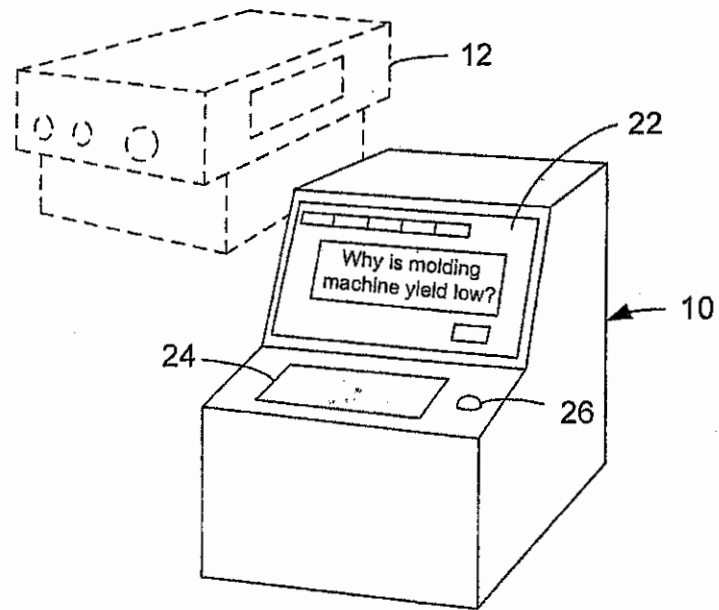


FIG. 1

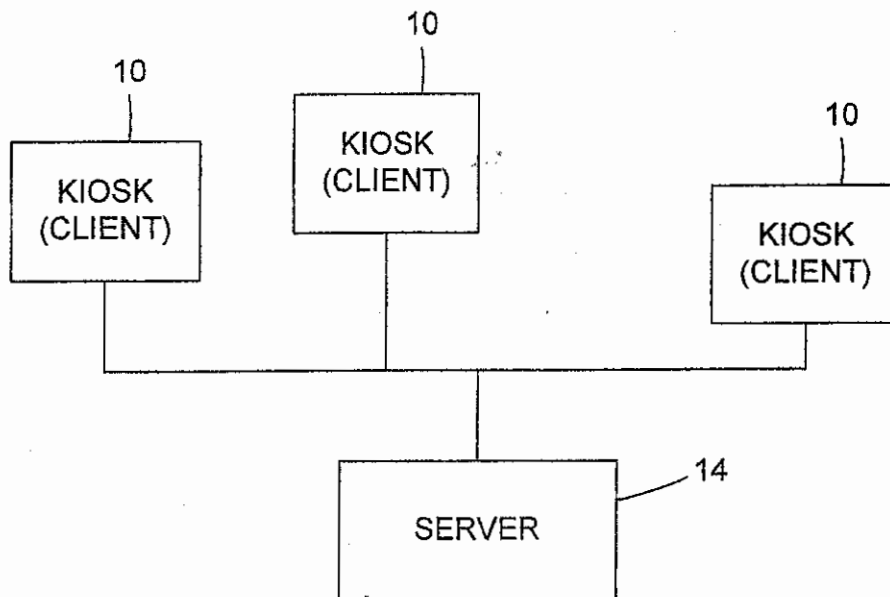


FIG. 2

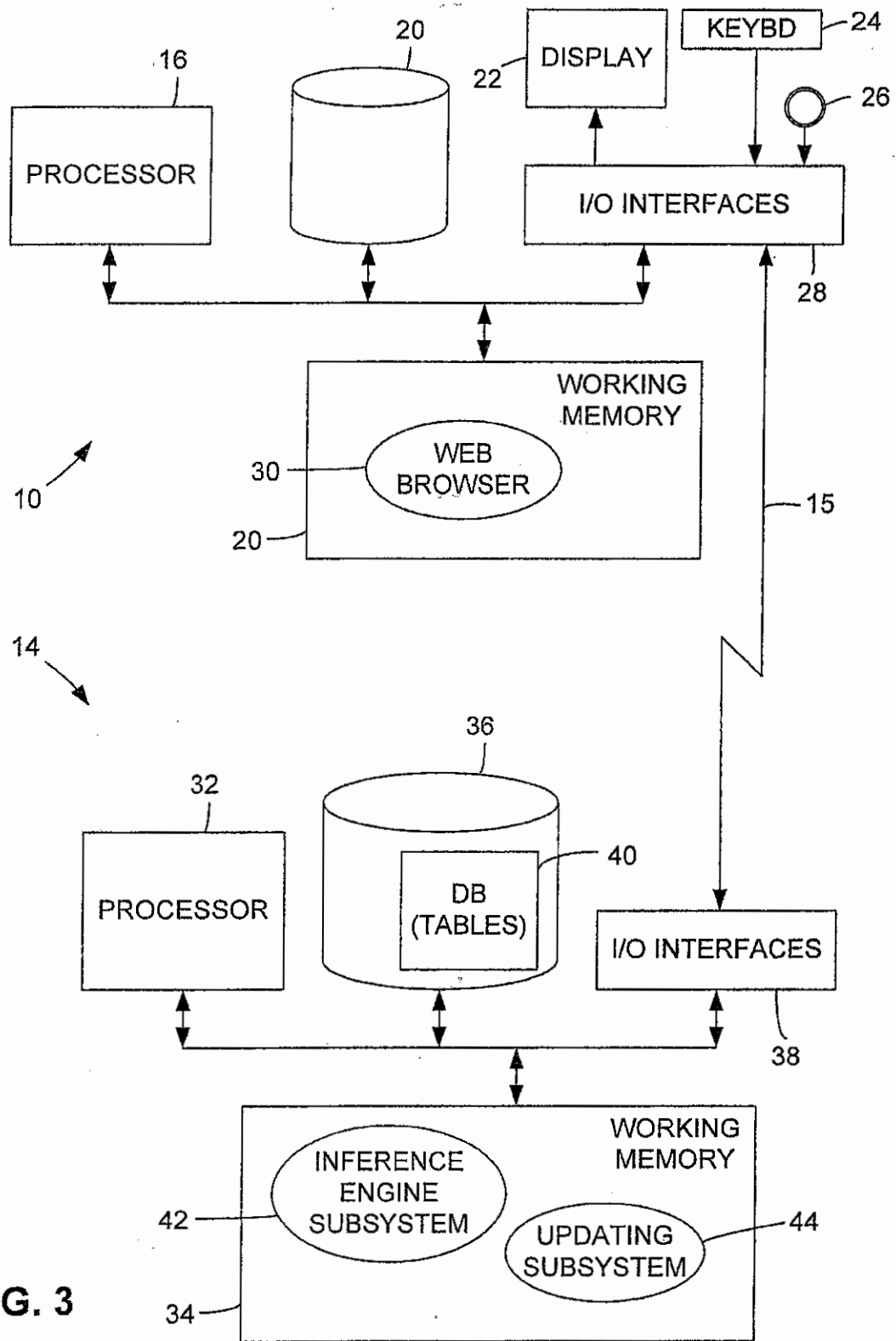


FIG. 3

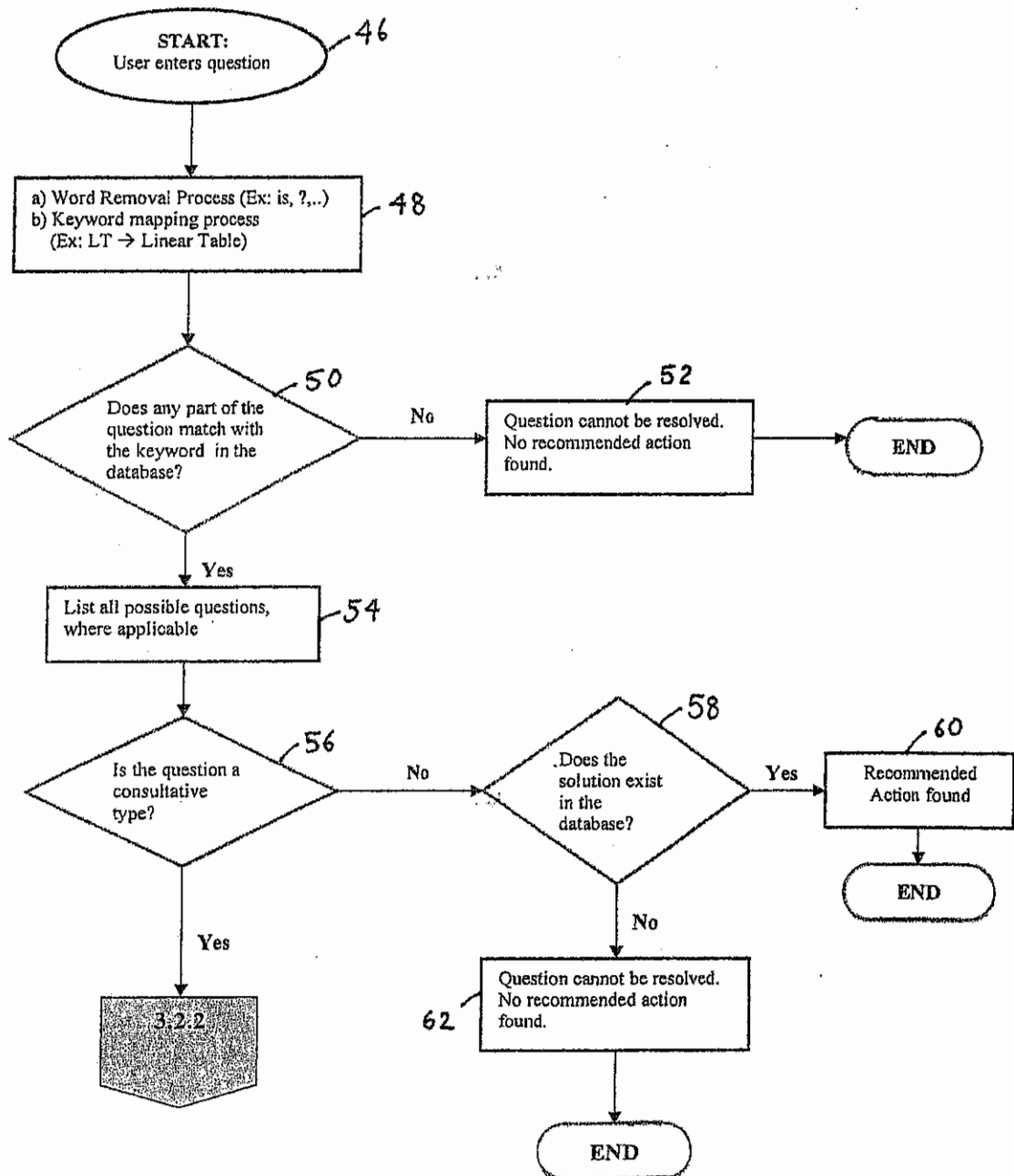


FIG. 4A

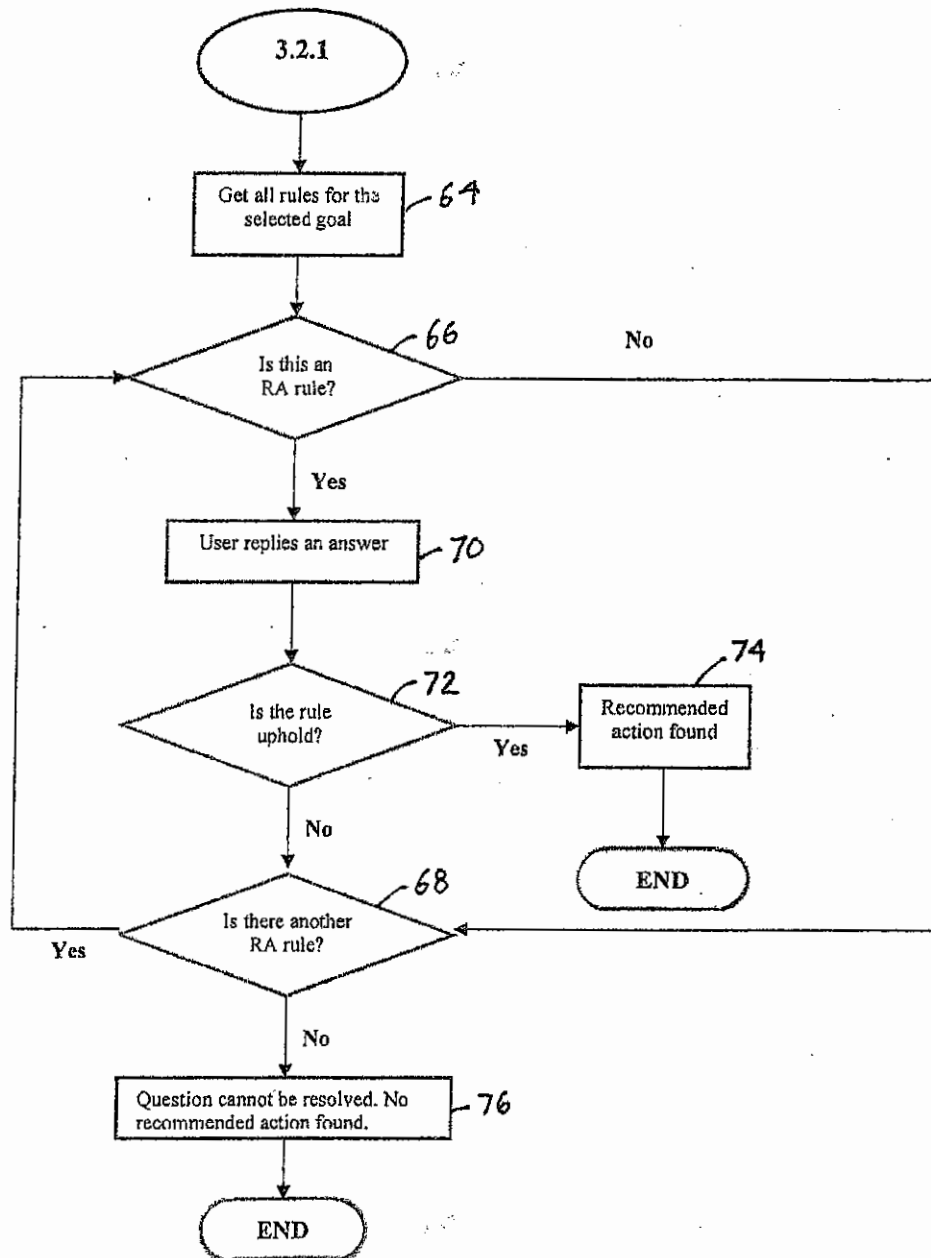


FIG. 4B

The screenshot shows the HERNIES website interface. At the top, there is a header with the text "HERNIES" and "Learn, Share, Knowledg". Below the header is a navigation bar with links: "Home", "About", "Ask Question", "Feedback", "Admin Console", "Technology", and "Logout". The main content area features a large text input field with the placeholder text "Please enter your question". Below the input field are two buttons: "Submit" and "Clear". At the bottom of the form, there is a small icon of a lightbulb and the text "How to ask question?" followed by an example: "Example: What is linear table?".

FIG. 5

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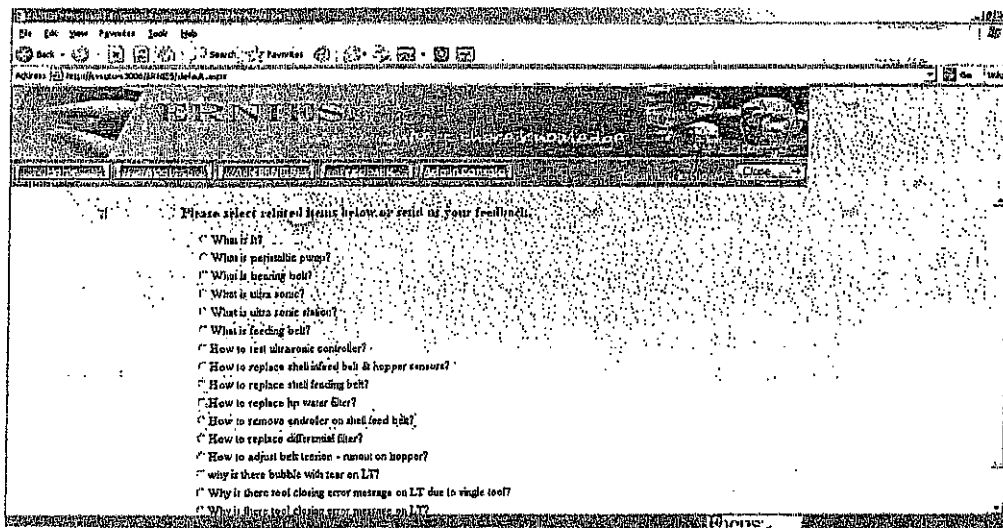


FIG. 6


HERNIES
 Engineers share knowledge

[Home](#)
[About Us](#)
[FAQ](#)
[Contact Us](#)
[Admin Console](#)
[Logout](#)

Recommendation

Your Name: **Ken Hoang Giang**
 Your Question: **What is linear table?**

[Submit](#)
[Cancel](#)

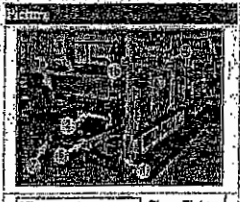
Rating:

The linear table produces one-day contact lenses fully automatically. A liquid polymeric material is used as the raw material to form a lens in the glass molds consisting of male molds and female molds.

Related Documents

N/A

Pictures



[Show Picture](#)

FIG. 7

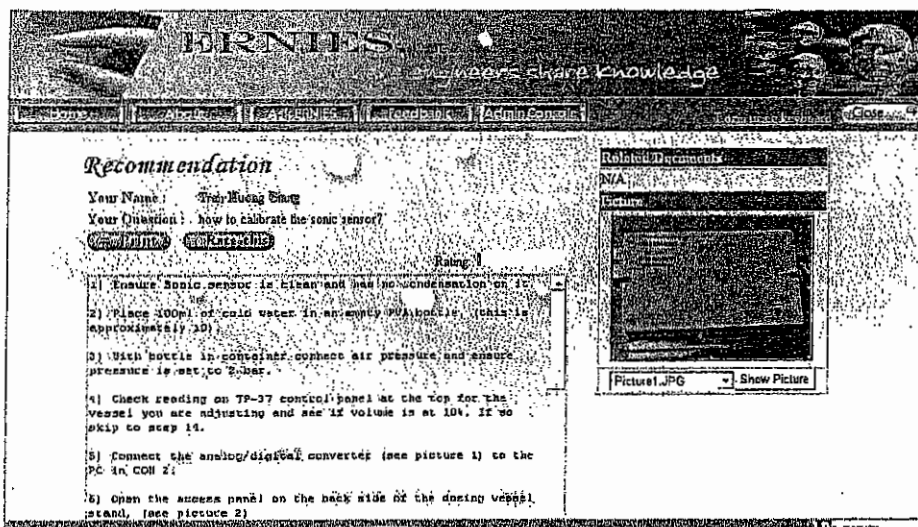
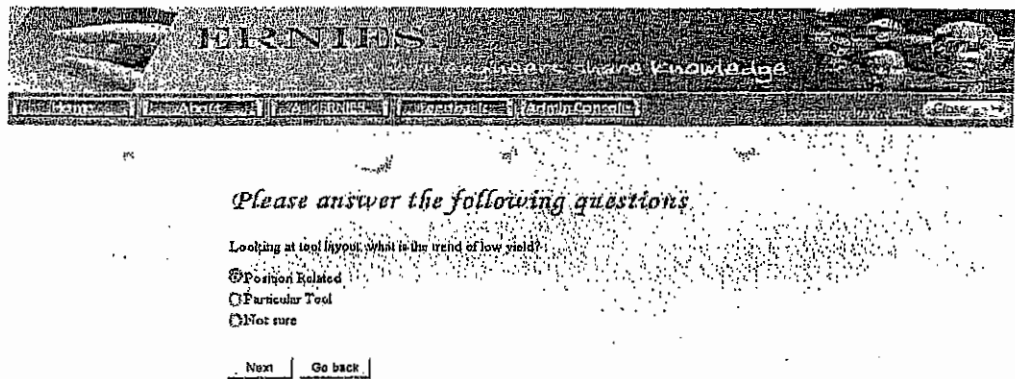


FIG. 8

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The screenshot shows a web application interface. At the top, there is a header bar with a logo on the left, the word "EARNERS" in the center, and the phrase "Learn. Share. Knowledg" on the right. Below the header, there is a navigation menu with several tabs: "Home", "My Profile", "My Dashboard", "My Progress", "My Results", and "My Account". The main content area displays the text "Please answer the following questions." followed by a question: "Looking at test layout, what is the trend of low yield?". Below the question, there are three radio button options: "Position Related", "Particular Tool", and "Not sure". At the bottom of the form, there are two buttons: "Next" and "Go back".

Please answer the following questions.

Looking at test layout, what is the trend of low yield?

☒ Position Related

☐ Particular Tool

☐ Not sure

[Next](#) [Go back](#)

FIG. 9

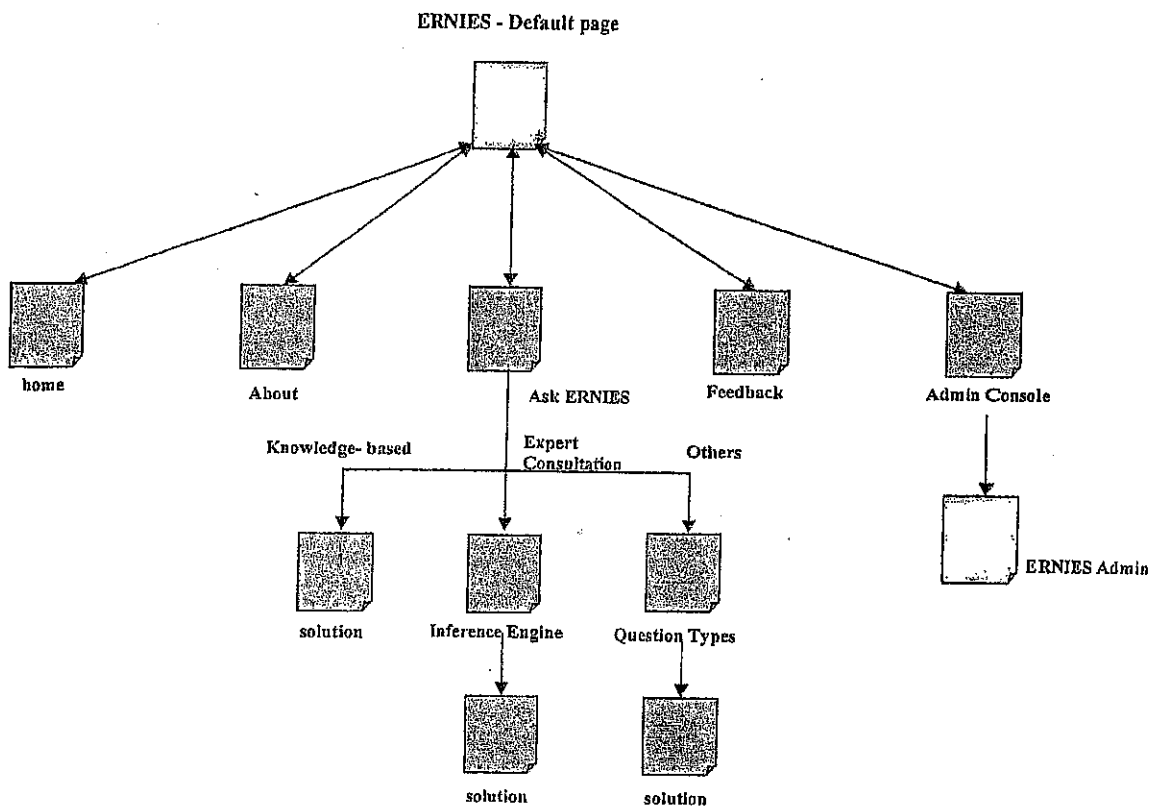


FIG. 10

Field Name	Data Type	Description
ObjectKey	Text	Object to be asked (ex: star gripper...)
Area	Text	Area of the object (ex: PP line...)
Answer	Memo	Answer to be displayed to users
PicturePath	Text	Path of picture related to the answer (in server)
Picture	Text	Picture name
File	Text	File related to the answer

FIG. 11

Field Name	Data Type	Description
ObjectKey	Text	Object to be asked (ex: star gripper...)
Area	Text	Area of the object (ex: PP line...)
Answer	Memo	Answer to be displayed to users
PicturePath	Text	Path of picture related to the answer (in server)
Picture	Text	Picture name
File	Text	File related to the answer

FIG. 12

Field Name	Data Type	Description
ProcedureID	Number	Index number (ex: 1, 2...)
ObjectKey	Text	Object to be asked (ex: sonic sensor...)
Action	Text	Action performed on the object (ex: calibrate...)
Area	Text	Area of the object (ex: PP line...)
Answer	Memo	Answer to the question
PicturePath	Text	Path of picture related to the answer (in server)
Picture	Text	Picture name

FIG. 13

Field Name	Data Type	Description
Area	Text	Area of the object (ex: PP line...)
TypeOfQuestion	Text	Ex: How long, How fast...
ObjectKey	Text	Object to be asked (ex: sonic sensor...)
Parameter	Text	Parameter of the object
Answer	Memo	Answer to the question

FIG. 14

Field Name	Data Type	Description
Goal_Id	Number	Goal ID
Rule_Id	Number	Rule ID
Premise_1	Text	Premise No.1: question 1 in every rule
Premise_1_Key	Text	Key word in Premise 1
Premise_1_Option	Text	Options for user to select in Premise 1
Premise_1_Answer	Text	Answer for Premise 1 in Inference Engine
Premise_1_Why	Text	Reason of asking Premise 1
Premise_Link	Text	Link between 2 premise (ex: and , or ..)
Premise_2	Text	Premise No.2: question 1 in every rule
Premise_2_Key	Text	Key word in Premise 2
Premise_2_Option	Text	Options for user to select in Premise 2
Premise_2_Answer	Text	Answer for Premise 2 in Inference Engine
Premise_2_Why	Text	Reason of asking Premise 2
Consequent	Memo	Solution for rule respectively
Consequent_Type	Text	Type of consequence (ex: "ra" or "r")
Consequent_CF	Double	Consequents' Confidential factor

FIG. 15

Field Name	Data Type	Description
WorkKey	Text	Key word of the premise
Goal_Id	Number	Goal ID
Rule_Id	Number	Rule ID
Probe Variable	Text	
User Answer	Text	

FIG. 16

Field Name	Data Type	Description
Goal_Id	Number	Goal id (ex: 1, 2...)
Goal_Desc	Text	Goal description, key word of a goal (ex: Why Bv1 low yield...)
Goal_Question	Text	Ex: Why is BV1 low yield?
Goal_Area	Text	

FIG. 17

Field Name	Data Type	Description
Type	Text	Type of word to be converted (General, Machine...)
KeyWord	Text	Word before converted
WordConversion	Text	Word after converted

FIG. 18

Field Name	Data Type	Description
Type	Number	This number to define the type of word to be removed (ex: 1 for words which stand at the beginning or end of the question. 2 for words which embraced by space.
WordToRemove	Text	Word to be removed

FIG. 19

SearchSolution.aspx (Ask ERNIES)	
Overview	
<ul style="list-style-type: none"> - SearchSolution.aspx (Ask ERNIES) is a page where users can enter the questions. - The coding behind will interpret the questions entered and classify the types of questions whether it's knowledge-based question or expert-consultation question. - Depend on what type of questions, ERNIES will lead users to different direction. <ul style="list-style-type: none"> ▪ Knowledge-based: provide solution to users. ▪ Expert-Consultation: start interpreting the scenario using inference Engine. ▪ Others: searching whether the object entered by users is found in database. 	
Interface components	
1. Textbox Name (txtName)	Web component
2. Textbox EmployeeID (txtEmployeeID)	Web component
3. Textbox Question (txtQuestion)	Web component
4. Button "Submit" (btnSubmit)	Web component
5. Button "Clear" (btnClear)	Web component
Code behind	
1. btnSubmit_Click	Private Sub
<ul style="list-style-type: none"> - Remove redundant words in the question string. - Replace common words in the question string. - Get the Session State for variables (Name, EmployeeID, Initial Question, Interpreted question). - Classify type of questions <ul style="list-style-type: none"> ▪ Knowledge-based (What, Where, How many, How to...): redirect to "solutions.aspx" in order to provide solution to users. ▪ Expert Consultation (Why): Perform function "GetGoal" (See below) ▪ Questions not defined: redirect to "questionType.aspx" to define whether there is any available question related to object entered by users. 	
2. btnClear_Click	Private Sub
<ul style="list-style-type: none"> - To clear text in the following textboxes: txtName, txtEmployeeID, txtQuestion. 	
3. GetGoal	Public Function
<ul style="list-style-type: none"> - This function is called when users enter "Why" questions. - Connect to "expertSystem.mdb", open table Goal_tbl, check whether a question entered by users is found. - If question is matched with one of the Goal description: <ul style="list-style-type: none"> ▪ Get GoalID from table Goal_tbl ▪ Set RuleID = 1 and PremiseID = 1 ▪ Get Session State for variables : GoalID, RuleID, PremiseID, Consequent (empty), ConsequentType ("ra"), KeyObjList (empty) ▪ Call function RuleCnt (See item 4) ▪ Redirect to "inferenceEngine.aspx" - If question is not matched any of the Goal description: <ul style="list-style-type: none"> ▪ Go to "message.aspx" and display message "Please check your question or send us your feedback" 	
4. RuleCnt	Public Function
<ul style="list-style-type: none"> - To get the max number of RuleID with the given GoalID in table Rule_tbl. - To get the max number of "ra" RuleID with the given GoalID in table Rule_tbl. - Get Session State for these 2 values. 	
5. Page_Load	Private Sub
<ul style="list-style-type: none"> - Call function DelWorkTbl() to delete the Work_tbl everytime the page is loaded. (See item 6) 	
6. DelWorkTbl	Public Function
<ul style="list-style-type: none"> - Execute the data deletion in table "Work_tbl" 	

FIG. 20

solutions.aspx	
Overview	
- "solutions.aspx" is a site where ERNIES displays the solution to users.	
Interface components	
1. Label UserName (lblUserName1)	Web component
2. Label EmployeeID (lblEmployeeID1)	Web component
3. Label Question (lblQuestion1)	Web component
4. TextArea Solution (textSolution1)	Web component
5. Button "Print Solution" (btnPrint)	Web component
6. Image Solution Picture (imgSolPic)	Web component
7. Drop down picture list (ddPictureList)	Web component
8. Button to Show picture (btnShow)	Web component
Code behind	
1. Page_Load	Private Sub
<ul style="list-style-type: none"> - Declare variables - Get Session State (Name, EmployeeID, Question, QuestionType, Original question) - Interpret the question <ul style="list-style-type: none"> ▪ split the question ▪ If "Why" question, get strRecommend from Session("Consequent"). <p>The Session("Consequent") is the result ERNIES retrieves after going through the inference Engine.</p> <ul style="list-style-type: none"> ▪ If other types of question such as "What" "Where" "How To" "How many", connect to database, get the answer and assign it to strRecommend. - Display the detail of the user, the question, the answer and the picture (if there is) to the users: <ul style="list-style-type: none"> ▪ Username : lblUserName1 ▪ Employee ID: lblEmployeeID1 ▪ Question : lblQuestion1 ▪ Answer : textSolution1.text = strRecommend ▪ Picture : imgSolPic.ImageUrl = strPicPath 	
2. btnShow_Click	Private Sub
<ul style="list-style-type: none"> - Get name of picture that user select to view. - Get path of the picture. - Get the Session State of the picture path. 	
3. NullHelper	Public Function
<ul style="list-style-type: none"> - This is to prevent the error from any empty string in the database. 	

FIG. 21

questionType.aspx	
Overview	
<ul style="list-style-type: none"> - This page is triggered after users enter any object (not a question) into "SearchSolution.aspx". - "questionType.aspx" will search whether this object is found in database. - If there is, ERNIES will ask users what type of questions they wish to know about the object. 	
Interface components	
1. Label lblQuestionType(lblQuestionType)	Web component
2. List of questions (lstQuestType)	Web component
3. Button Submit (btnSubmit)	Web component
Code behind	
1. Page_Load	Private Sub
<ul style="list-style-type: none"> - Declare variables - Interpret the object submitted by user <ul style="list-style-type: none"> ▪ Search from "WhatIs" table: if object is found, add "What is + strObject?" to the listQuestions ▪ Search from "WhereIs" table: if object is found, add "Where is + strObject?" to the listQuestions ▪ Search from "HowTo" table: if object is found, add "How to + strAction + strObject ?" to the listQuestions ▪ Search from "HowMany" table: if object is found, add "How many + strObject + are there?" to the listQuestions ▪ Search from "Goal_desc" table: if object is found, add "Why" question to the listQuestions - intTemp is a temp variable. <ul style="list-style-type: none"> ▪ intTemp = 1 when Object is found in database. ▪ intTemp = 0 when no object is found. - Display the questions to user: <ul style="list-style-type: none"> ▪ intTemp = 1 : display question(s) on "questionType.aspx" ▪ intTemp = 0 : redirect to "message.aspx" and display "Please check your question or send us your feedback. Thanks." 	
2. btnSubmit_Click	Private Sub
<ul style="list-style-type: none"> - Get the question string (strQuestion) - Perform the same procedure as in "SearchSolution.aspx" 	

FIG. 22

inferenceEngine.aspx	
Overview	
<ul style="list-style-type: none"> - Triggered after the "searchSolution.aspx" <ul style="list-style-type: none"> ▪ User enter "Why" question ▪ Searching the related GoalID ▪ Redirect to inferenceEngine.aspx - Process <ul style="list-style-type: none"> ▪ Searching from Rule_tbl with the GoalID retrieved from "searchSolution.aspx". ▪ Get Premise questions for each RuleID with the given GoalID. ▪ Display Premise and selection to users. ▪ Get selection from user and compare it to the correct answer. ▪ Get the Consequent and redirect to "solutions.aspx" if answer from user is same as answer from the Premise. ▪ Proceed to next RuleID if the answer is not correct. Repeat the same procedure in "inferenceEngine.aspx". 	
Interface components	
1. Label Rule Description (lblRule_desc)	Web component
2. Radio button Selection (lstSelection)	Web component
3. Button Next (btnNext)	Web component
4. Button Go Back (btnGoBack)	Web component
Code behind	
1. Page Load	Private Sub
<ul style="list-style-type: none"> - The "inferenceEngine.aspx" page always load question and selection from the inference Engine. - Perform the following sequence until the Consequence (solution) is retrieved: <ul style="list-style-type: none"> ▪ Get Goal_ID, Rule_ID, Premise_ID, Consequence Type ▪ Call GetRules based on the above values ▪ The Premise and the selection after the sequence in GetRules ▪ If there is still Rule found, display Premise and selection to the users in "inferenceEngine.aspx". ▪ If there is no Rule found, no relative Consequent found, proceed to "solutions.aspx" and display "There is temporarily no recommendation for your case. Please send us some feedback." 	
2. GetRules	Public Function
Description: Premise descriptions will be retrieved in this Function Sequence: <ul style="list-style-type: none"> - Declare variables - Retrieve Premises for "ra" Type <ul style="list-style-type: none"> > For Premise 1: <ul style="list-style-type: none"> ▪ If Premise had not been asked before: Get related data from Premise 1 	

FIG. 23A

- If Premise had been asked before:
Call `CheckUserAns()` and set `GetRules_tempflag = 1`
- > For Premise 2:
 - If Premise had not been asked before: Get related data from Premise 2
 - If Premise had been asked before:
Call `CheckUserAns()` and set `GetRules_tempflag = 2`
- Retrieve Premises for "r" Type
 - > For Premise 1:
 - If Premise had not been asked before: Get related data from Premise 1
 - If Premise had been asked before:
Call `CheckUserAns()` and set `GetRules_tempflag = 3`
 - > For Premise 2:
 - If Premise had not been asked before: Get related data from Premise 2
 - If Premise had been asked before:
Call `CheckUserAns()` and set `GetRules_tempflag = 4`
- Get Session States
- Interpret the `GetRules_tempflag`
 - > Definition: The `GetRules_tempflag` is used to define whether the Premise can be skipped if it has been asked before.
 - > `GetRules_tempflag = 1`
 - if `PremiseLink = "and"` or `"or"` : Move to the next Premise
 - if `PremiseLink = "-"`
 - > `GetRules_tempflag = 2`
 - Move to the next "ra" Rule
 - > `GetRules_tempflag = 3`
 - Move to the next Premise of the same "r" rule
 - > `GetRules_tempflag = 4`
 - Move to the next "ra" Rule

3. btnNext_Click

Public Sub

- Declare variables
- Get selection from user
- Create a work key string (`StrWorkKey0`)
- Save data into `Work_tbl`
- Call `EvaluateGoal()`
- Get results after the `EvaluateGoal()`
- If Consequent is found, redirect to "solutions.aspx"
- If Consequent is not found, continue searching in inference Engine

4. EvaluateGoal

Public Function

Overview: to evaluate the selection done by users

Process:

- For "ra" Rules, `PremiseLink = "-"`:
 - If User answer = Premise answer: set
`int_EvaluateGoal = 3`

FIG. 23B

- If User answer = "Not sure": set int_EvaluateGoal = 0
- Else set int_EvaluateGoal = 1
- For "ra" Rules, PremiseLink = "and":
 - If User answer = "Not sure": set int_EvaluateGoal = 0
 - If User answer <> Premise answer:
 - . If PremiseID = 1: set int_EvaluateGoal = 0 and Session("tempflag") = 1
 - . If PremiseID = 2: set int_EvaluateGoal = 1
 - If User answer = Premise answer:
 - . If PremiseID = 1: set int_EvaluateGoal = 2 and Session("tempflag") = 1
 - . If PremiseID = 2 and Session("tempflag") = 1: set int_EvaluateGoal = 3
 - . If PremiseID = 2 and Session("tempflag") = 1: set int_EvaluateGoal = 1
- For "r" Rules, PremiseLink = "and":
 - If User answer = "Not sure": set int_EvaluateGoal = 0
 - If User answer <> Premise Answer
 - . If PremiseID = 1: set int_EvaluateGoal = 2
 - . If PremiseID = 1: set int_EvaluateGoal = 1
 - If User answer = Premise Answer: set int_EvaluateGoal = 3
- For "r" Rules, PremiseLink = "and":
 - If User answer <> Premise Answer: set int_EvaluateGoal = 1
 - If User answer = Premise Answer: set int_EvaluateGoal = 3
- For "r" Rules, PremiseLink = "and":
 - If User answer <> Premise Answer
 - . If Premise = 1 : set int_EvaluateGoal = 2, Session("tempflag") = 0
 - . If Premise = 2: set int_EvaluateGoal = 1
 - If User answer = Premise Answer:
 - . If PremiseID = 1: set int_EvaluateGoal = 2 and Session("tempflag") = 1
 - . If PremiseID = 2 and Session("tempflag") = 1: set int_EvaluateGoal = 3
 - . If PremiseID = 2 and Session("tempflag") = 0: set int_EvaluateGoal = 1
- For "r" Rules, PremiseLink = "or":
 - If User answer = Premise Answer: set int_EvaluateGoal = 3
 - If User answer <> Premise Answer:
 - . If PremiseID = 1: set int_EvaluateGoal = 2
 - . If PremiseID = 2: set int_EvaluateGoal = 1
- After Evaluate the selection, Get the value of int_EvaluateGoal
- Call InterpretResult(int_EvaluateGoal)

5. InterpretResult

Public Sub

- If int_EvaluateGoal = 0: move to related "r" rule
 - Call function GetR_Rule based on Premise Link, Premise Key, GoalID, Premise ID

FIG. 23C

<ul style="list-style-type: none"> - If int_EvaluateGoal = 1: <ul style="list-style-type: none"> ▪ For "ra" rules: move to the next "ra" rule ▪ For "r" rules: move to the next "ra" rule - If int_EvaluateGoal = 2: move to the next Premise in the same rule - If int_EvaluateGoal = 3: get and display Consequence <ul style="list-style-type: none"> ▪ Call function GetConsequence ▪ Get Session("Consequent") 	
6. GetConsequence	Public Function
<ul style="list-style-type: none"> - This function needs 3 inputs: GoalID, RuleID, and Consequent Type. - Connect to database, open Rule_tbl <ul style="list-style-type: none"> > For "ra" type: Get Consequent > For "r" type: <ul style="list-style-type: none"> ▪ Get Consequent, Consequent CF ▪ Set tempflag = 1 - tempflag : ERNIES will get the Consequent of to the previously related "ra" ruleID when this flag is set to 1. 	
7. GetR_Rule	Public Function
<ul style="list-style-type: none"> - Get "r" rule information based on Premise Link, Keyword, and Goal ID - Connect to database, open Rule_tbl, select all information belonging to "r" rule - Check if the keyword from previously related "ra" rule is found in "r" rule Consequent. - Get "r" RuleID if keyword is found in the "r" Consequent. - Move to the next "ra" If there the keyword is not found. - cntR_Rule: this flag is set to define whether there is any "r" rule with the given GoalID. If there is no "r" Rule , ERNIES will proceed to next Premise or next "ra" Rules. 	
8. CheckUserAns	Public Function
<ul style="list-style-type: none"> - This function is to check the user selection against the Work_tbl in database. 	
9. DelWorkTbl	Public Function
<ul style="list-style-type: none"> - This function is to delete all the record in the Work_tbl. 	
10. btnGoBack_Click	Private Sub
<ul style="list-style-type: none"> - This function is to allow user to go back to the beginning RuleID of the given GoalID. - Call DelWorkTbl when the button is fired. 	
11. NullHelper	Public Function
<ul style="list-style-type: none"> - This is to prevent the error from any empty string in the database. 	

FIG. 23D