FIG. 1a PRIOR ART

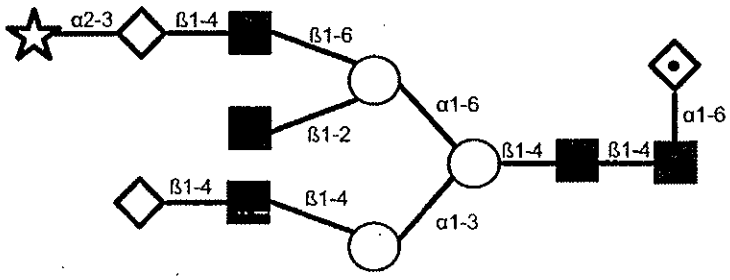


FIG. 1b PRIOR ART

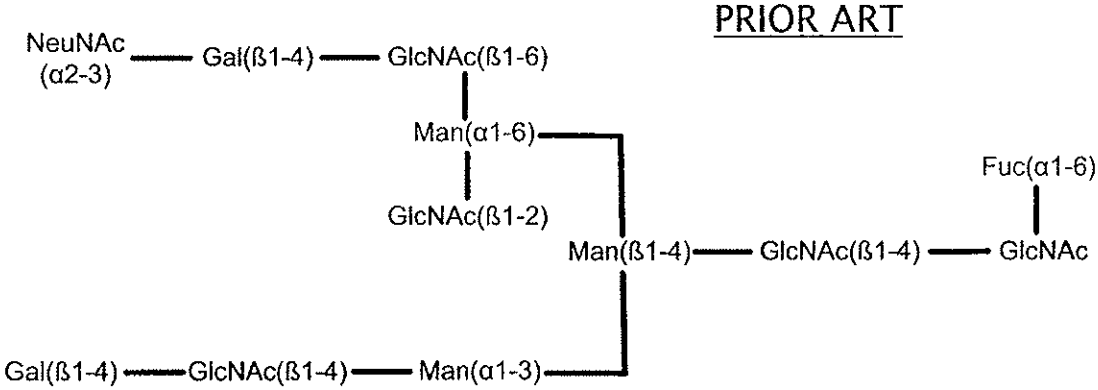


FIG. 1c PRIOR ART

[][Asn]{[(4+1)][b-D-GlcNAc]{[(4+1)][b-D-GlcNAc]{[(4+1)][b-D-Man]{[(3+1)][a-D-Man]{[(4+1)][b-D-GlcNAc]{[(4+1)][b-D-Gal]{}}}{(6+1)][a-D-Man]{[(2+1)][b-D-GlcNAc]{}[(6+1)][b-D-GlcNAc]{[(4+1)][b-D-Gal]{[(2-3)][a-D-Neu5Ac]{}}}}}}[(6+1)][a-D-Fuc]{}}}

FIG. 1d PRIOR ART

Ab4GNb4Ma3(GNb2(NNa3Ab4GNb6)Ma6)Mb4GNb4(Fa6)GN

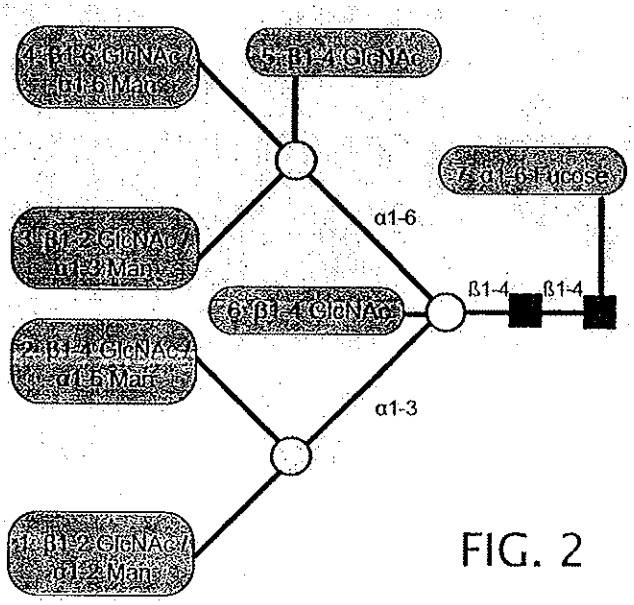

4: β1-6 GlcNAc / α1-6 Man
5: β1-4 GlcNAc
7: α1-6 Fucose
3: β1-2 GlcNAc / α1-3 Man
α1-6
ß1-4
ß1-4
6: β1-4 GlcNAc
2: β1-4 GlcNAc / α1-6 Man
α1-3
1: β1-2 GlcNAc / α1-2 Man

FIG. 2

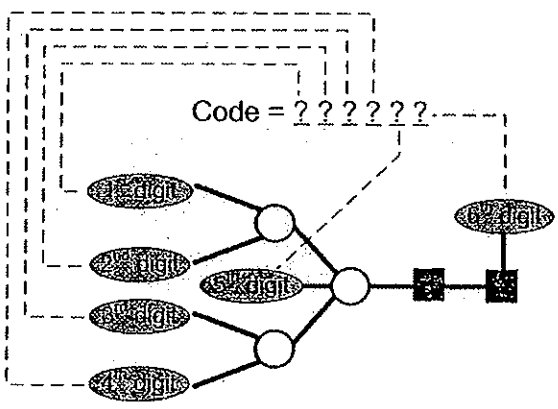

Code = ? ? ? ? ? ?
1st digit
2nd digit
3rd digit
4th digit
5th digit
6th digit

FIG. 3

FIG. 4a

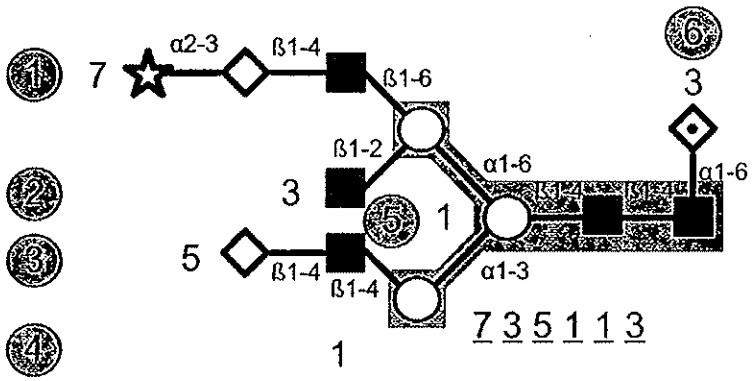


FIG. 4b

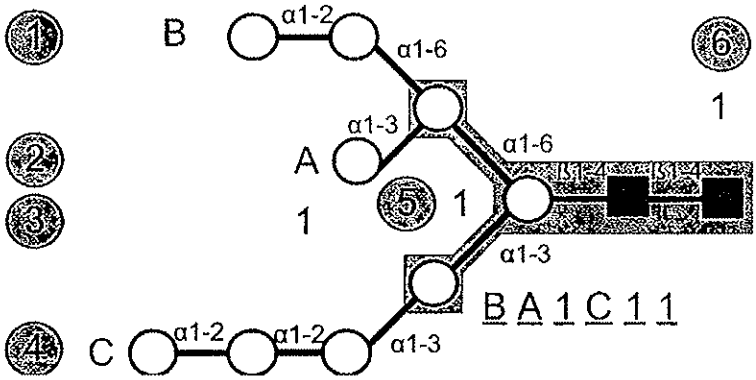


FIG. 4c

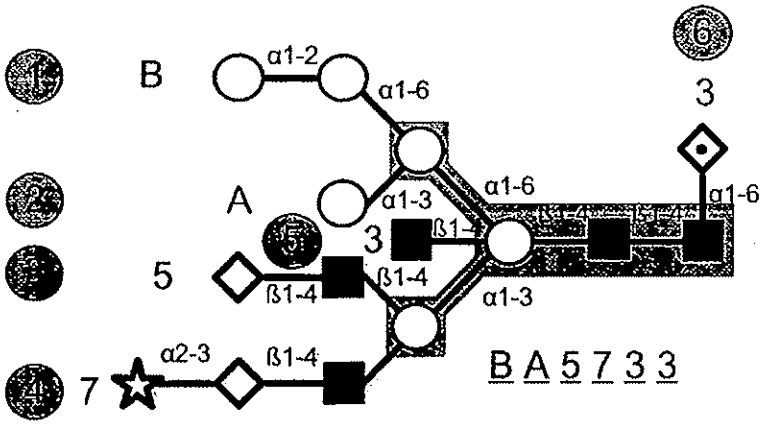


FIG. 5a

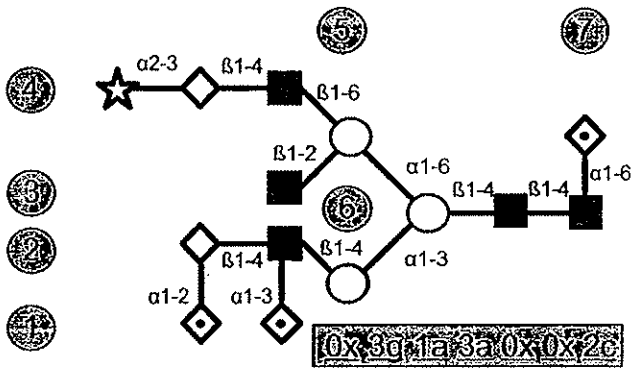


FIG. 5b

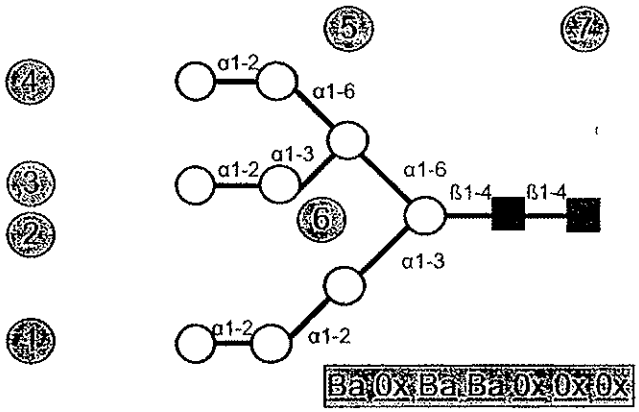


FIG. 5c

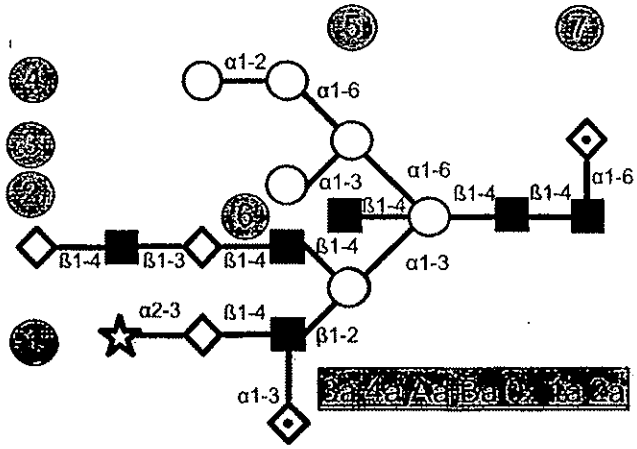


FIG. 6a

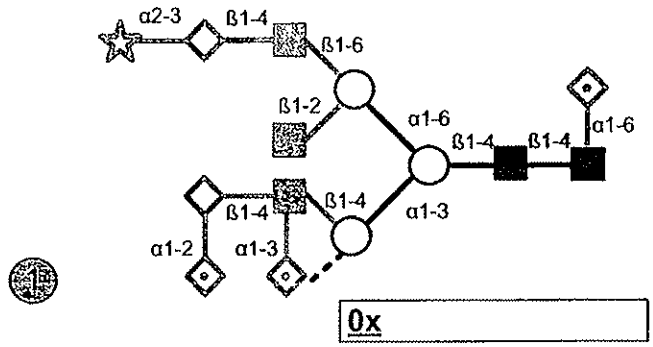


FIG. 6b

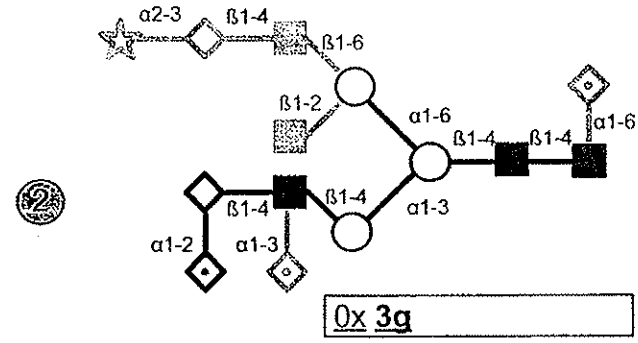


FIG. 6c

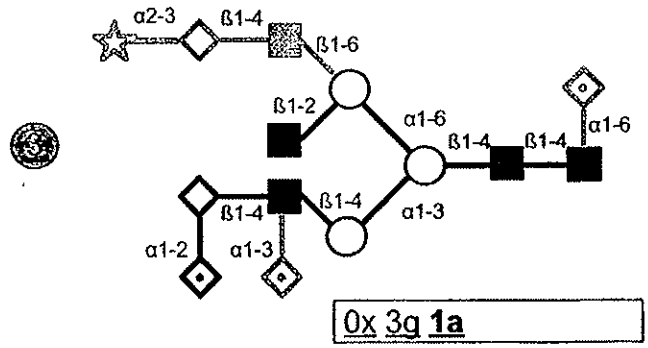


FIG. 6d

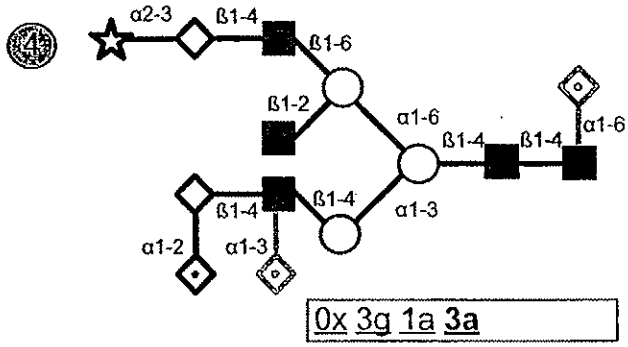


FIG. 6e

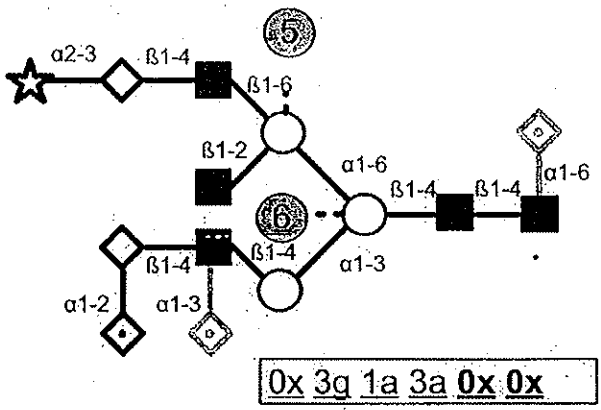


FIG. 6f

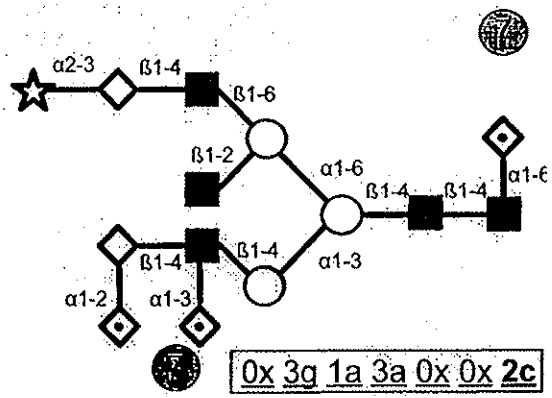


FIG. 7

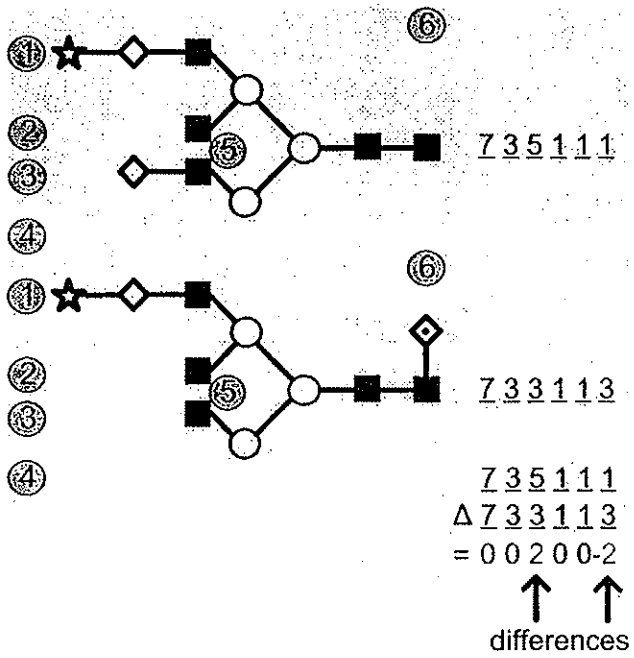

7 3 5 1 1 1
7 3 3 1 1 3
7 3 5 1 1 1
Δ 7 3 3 1 1 3
= 0 0 2 0 0-2
differences

FIG. 8

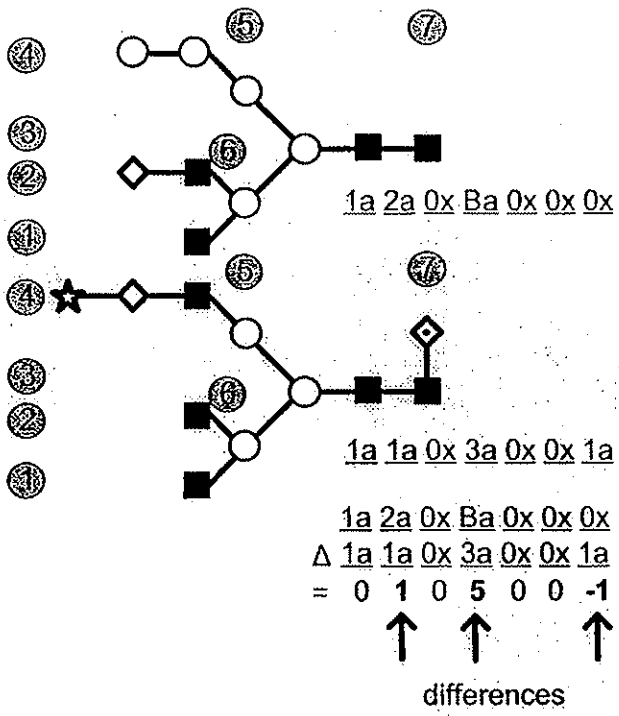

1a 2a 0x Ba 0x 0x 0x
1a 1a 0x 3a 0x 0x 1a
1a 2a 0x Ba 0x 0x 0x
Δ 1a 1a 0x 3a 0x 0x 1a
= 0 1 0 5 0 0 -1
differences

FIG. 9

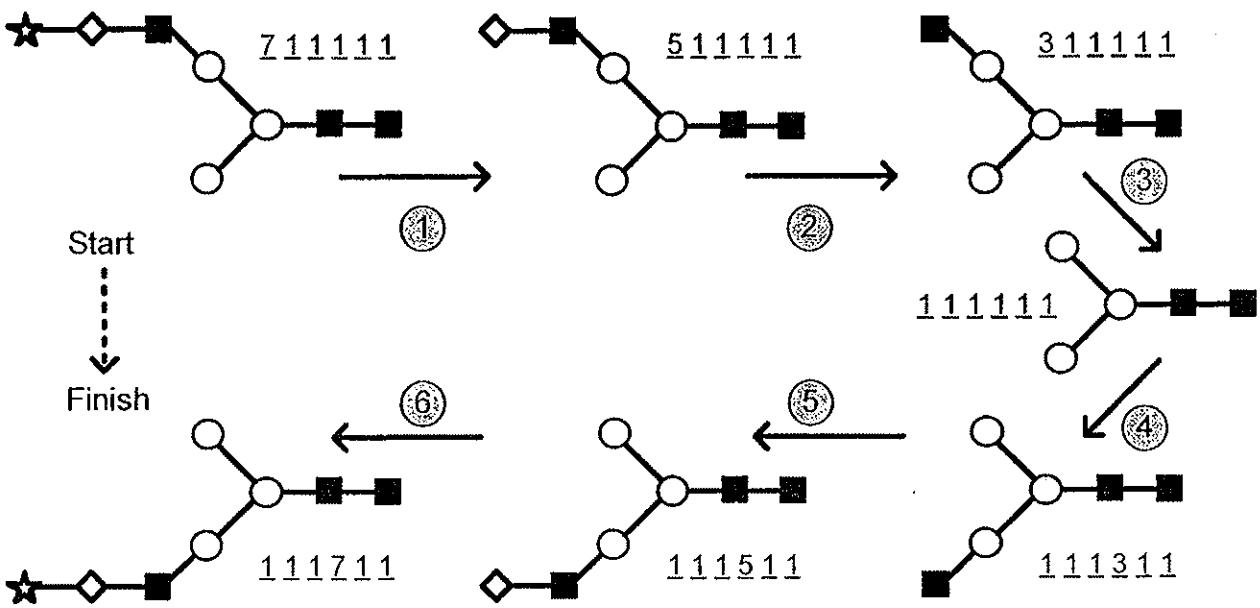


FIG. 11a

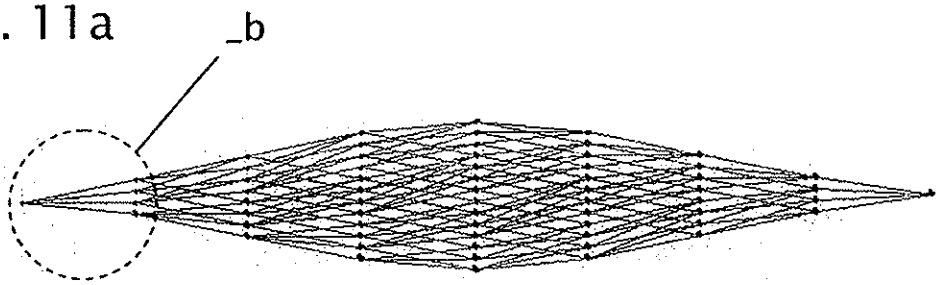


FIG. 11b

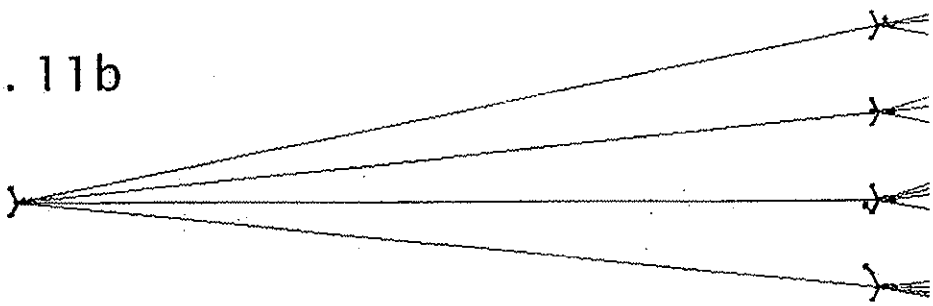


FIG. 10

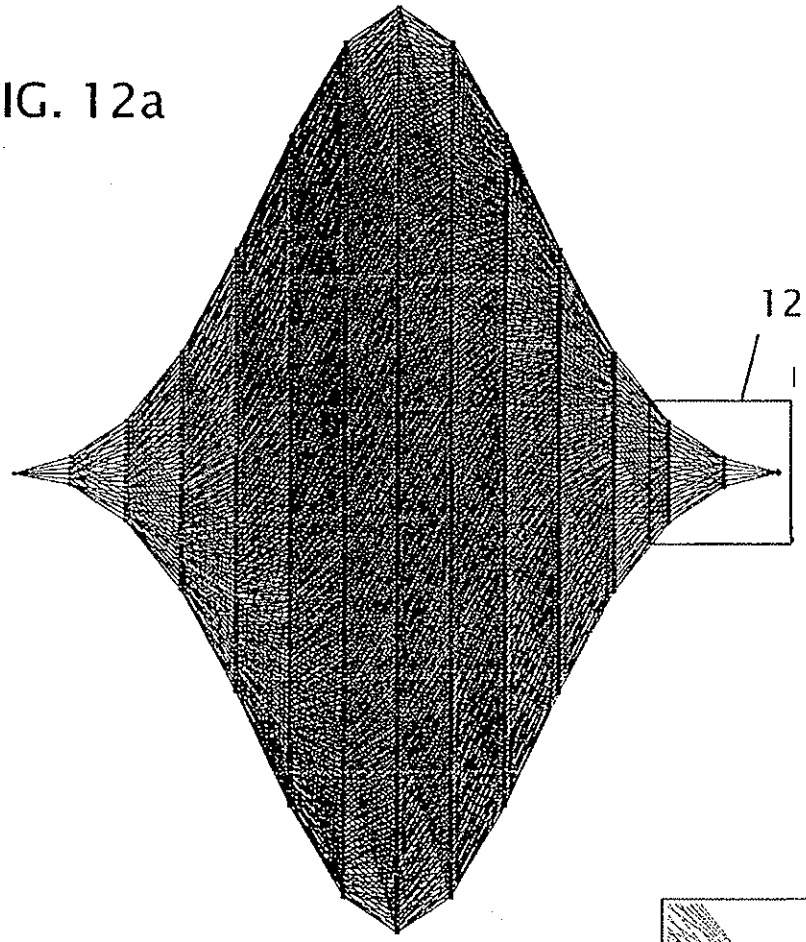
```
Function isrxn(glycan1, glycan2)

diff = glycan1 Δ glycan2
index = index of non-zero elements in diff
if(num non-zero elements == 1)
  if(abs(diff[index]/2) == 1)
    output 1
  else
    if(abs(diff[index]/2)==0.5 && glycan1[index]==1)
      output 1
    else
      output 0
    end if
  end if
end if
```

```
Function rxn_matrix(glycanList)

num_glycans = number of glycans in the list
if(num_glycans < 2)
  output 'There must be at least 2 glycans to form a reaction.'
else
  create rxn_matrix of size(num_glycans x num_glycans)
  set all values in rxn_matrix = 0
  for i=1:num_glycans-1
    for j=(i+1):num_glycans
      glycan1 = glycanList[i]
      glycan2 = glycanList[j]
      if (isrxn(glycan1,glycan2) == 1)
        rxn_matrix[i,j] = 1
        rxn_matrix[j,i] = 1
      end if
    end for
  end for
end if
```

FIG. 12a



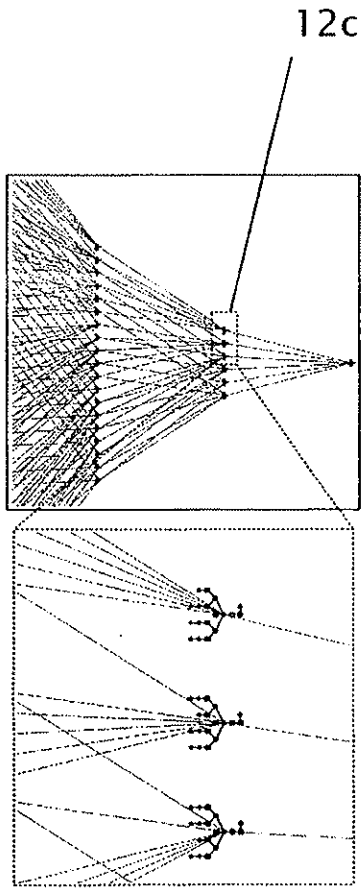


FIG. 12b

FIG. 12c

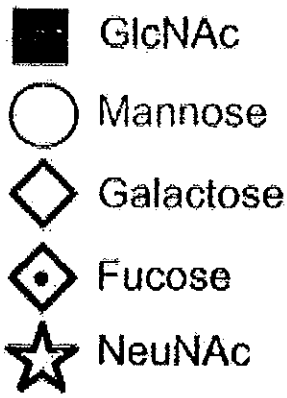


FIG. 13