US005317943A

United States Patent [19]

Dowdle

[11] Patent Number: 5,317,943

[45] Date of Patent: Jun. 7, 1994

[54] METHOD AND APPARATUS FOR ULTRASONICALLY CUTTING MAT BOARD

[75] Inventor: Barton K. Dowdle, 2973 W. 8565 South, West Jordan, Utah 84088

[73] Assignees: Robert K. Dowdle; Burton K. Dowdle, both of South Jordan, Utah

[21] Appl. No.: 839,395

[22] Filed: Feb. 20, 1992

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 490,045, Mar. 6, 1990, Pat. No. 5,100,270.

[51] Int. Cl.[5] B23C 3/00; B27C 5/02

[52] U.S. Cl. 83/56; 83/100; 83/577; 409/132

[58] Field of Search 409/80, 84, 107, 132, 409/138, 217, 224, 259; 83/13, 56, 100, 577; 51/165.9; 82/46; 269/309

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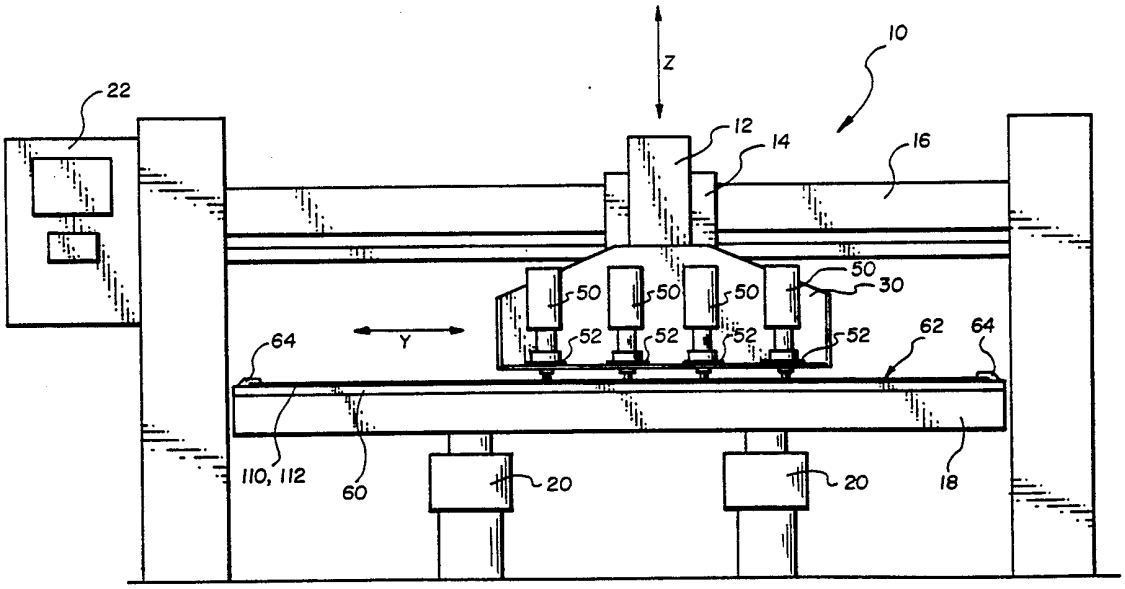
Primary Examiner—Z. R. Bilinsky

Attorney, Agent, or Firm—Trask, Britt & Rossa

[57] ABSTRACT

A method and apparatus for cutting mat board, and more specifically for cutting apertures including non-linear boundaries in mat board. The preferred embodiment of the apparatus of the present invention includes an automatically controlled ultrasonic cutting tool for cutting apertures having bevelled boundaries according to a predetermined pattern. The preferred embodiment of the method of the present invention includes stacking first and second mat boards and cutting through said first board into but not through said second, removing said first board, and cutting the same aperture in the same location in said second mat board which has been stacked on a third, uncut mat board.

15 Claims, 6 Drawing Sheets



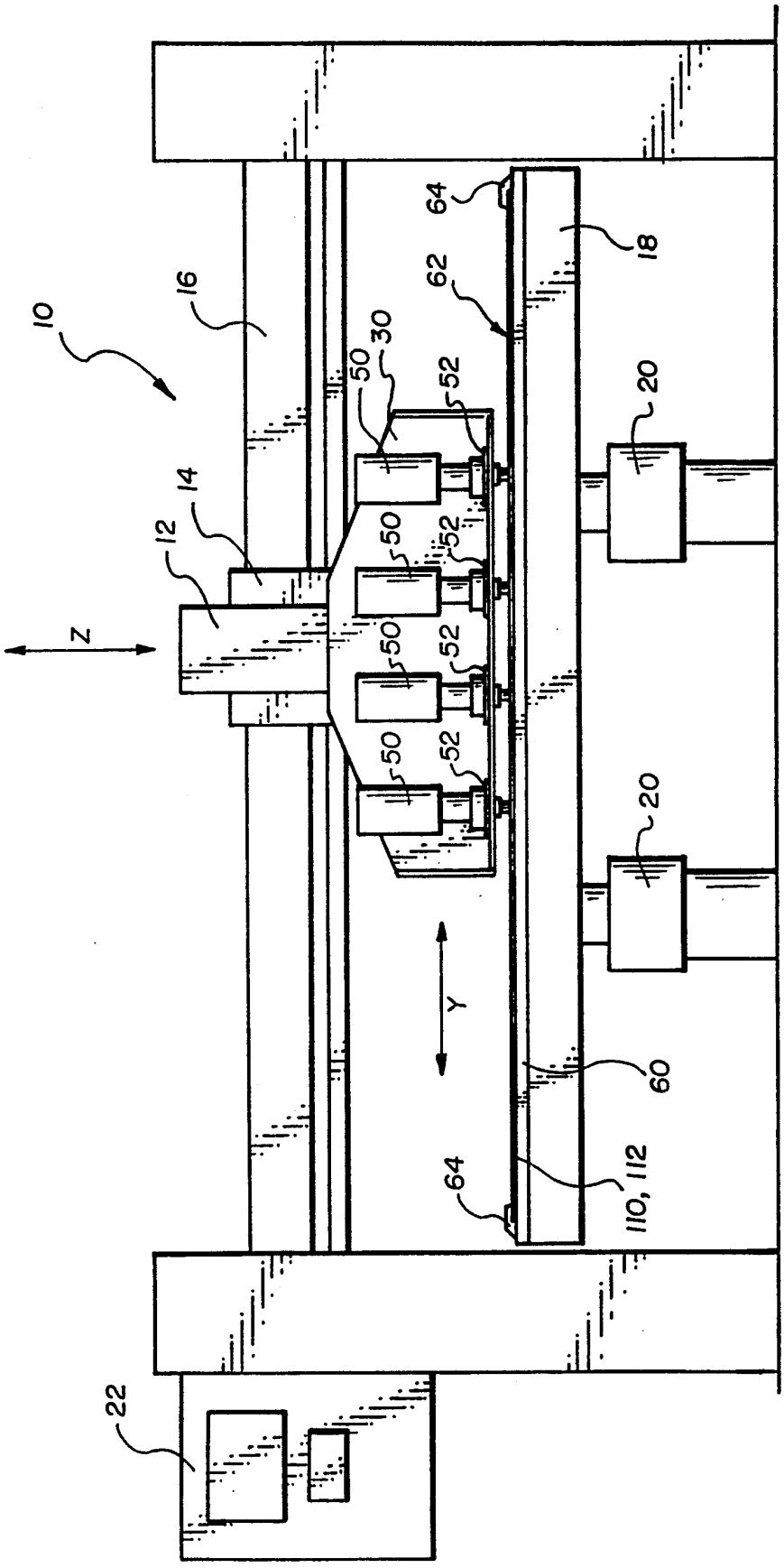


Fig. 1

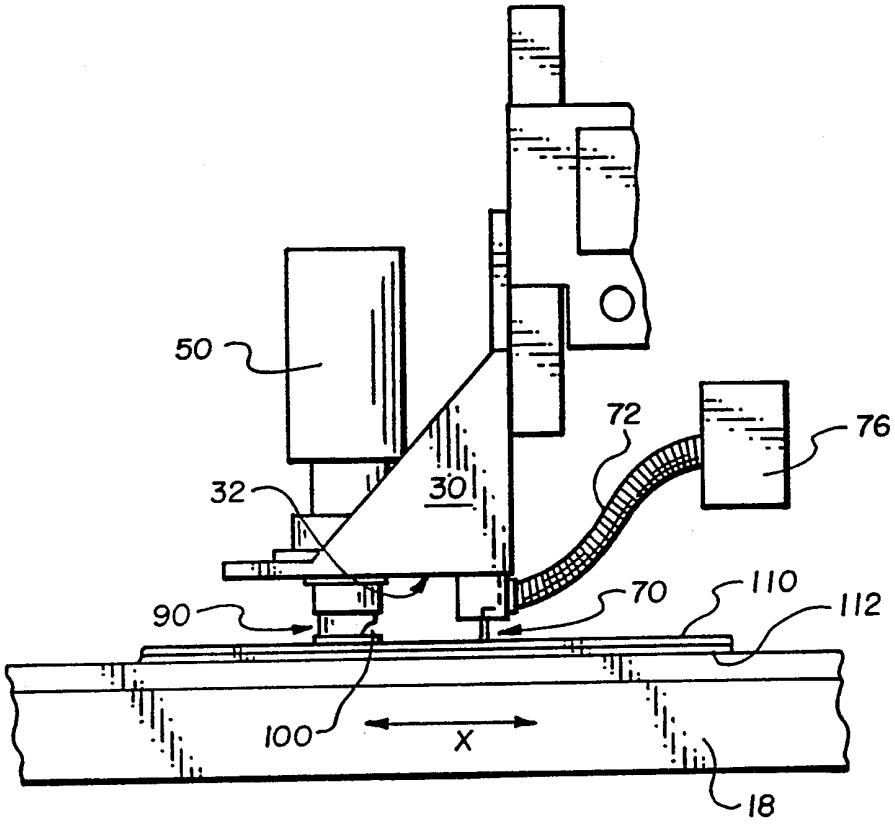


Fig. 2

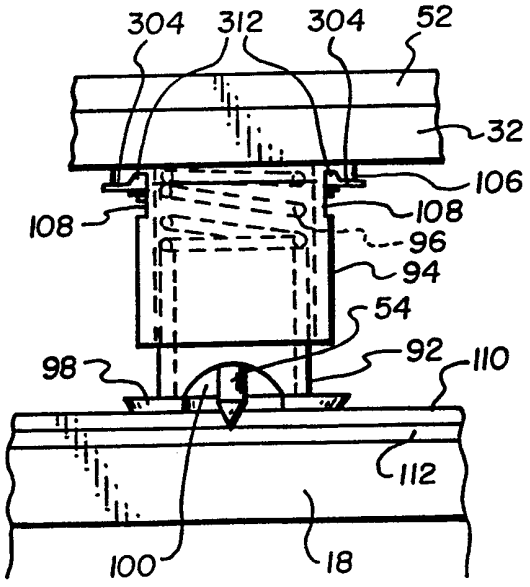


Fig. 3

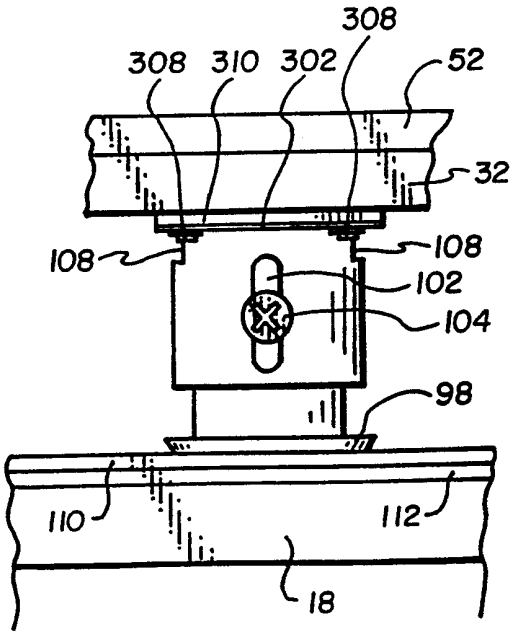


Fig. 4

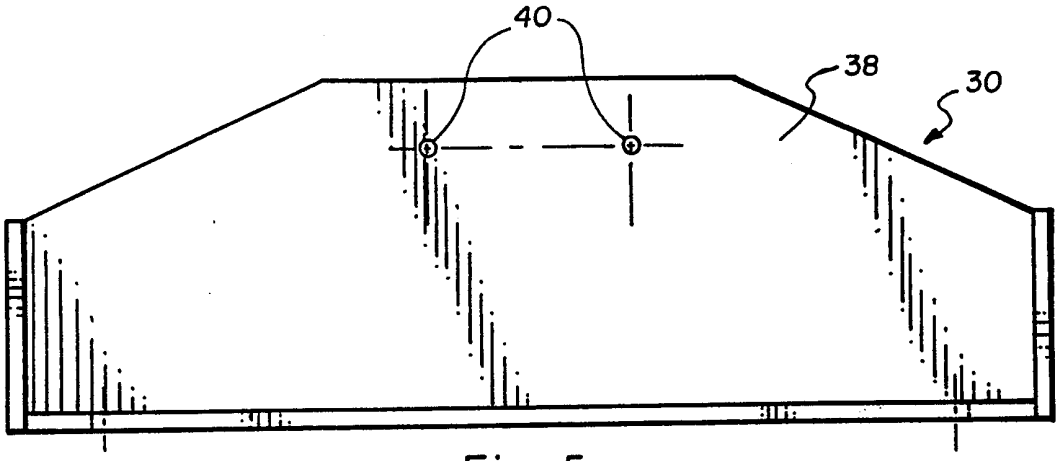


Fig. 5

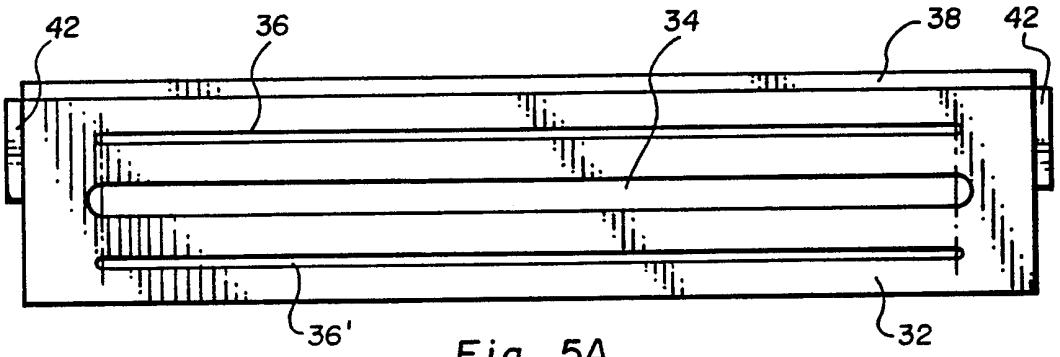


Fig. 5A

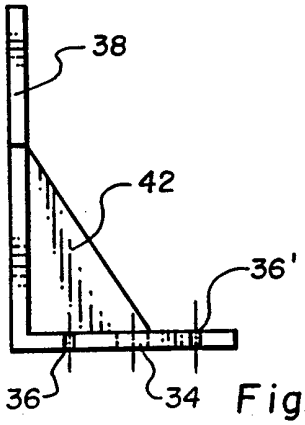
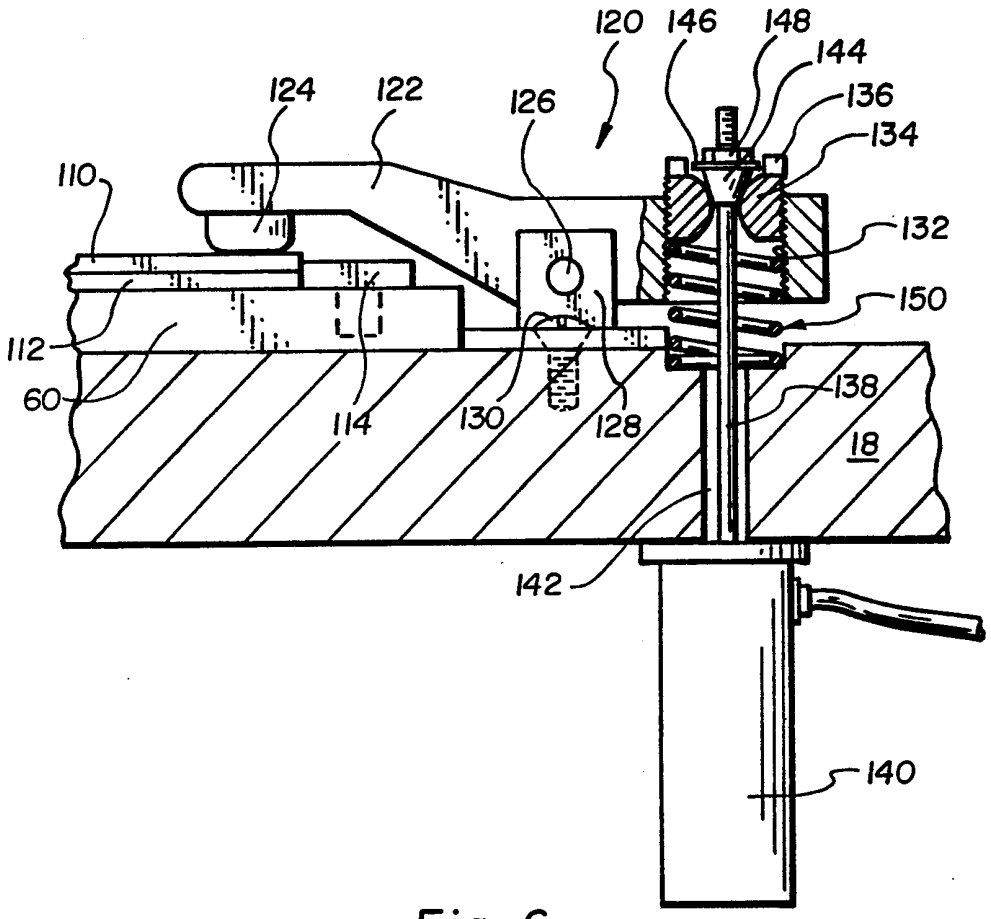


Fig. 5B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142
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Fig. 6

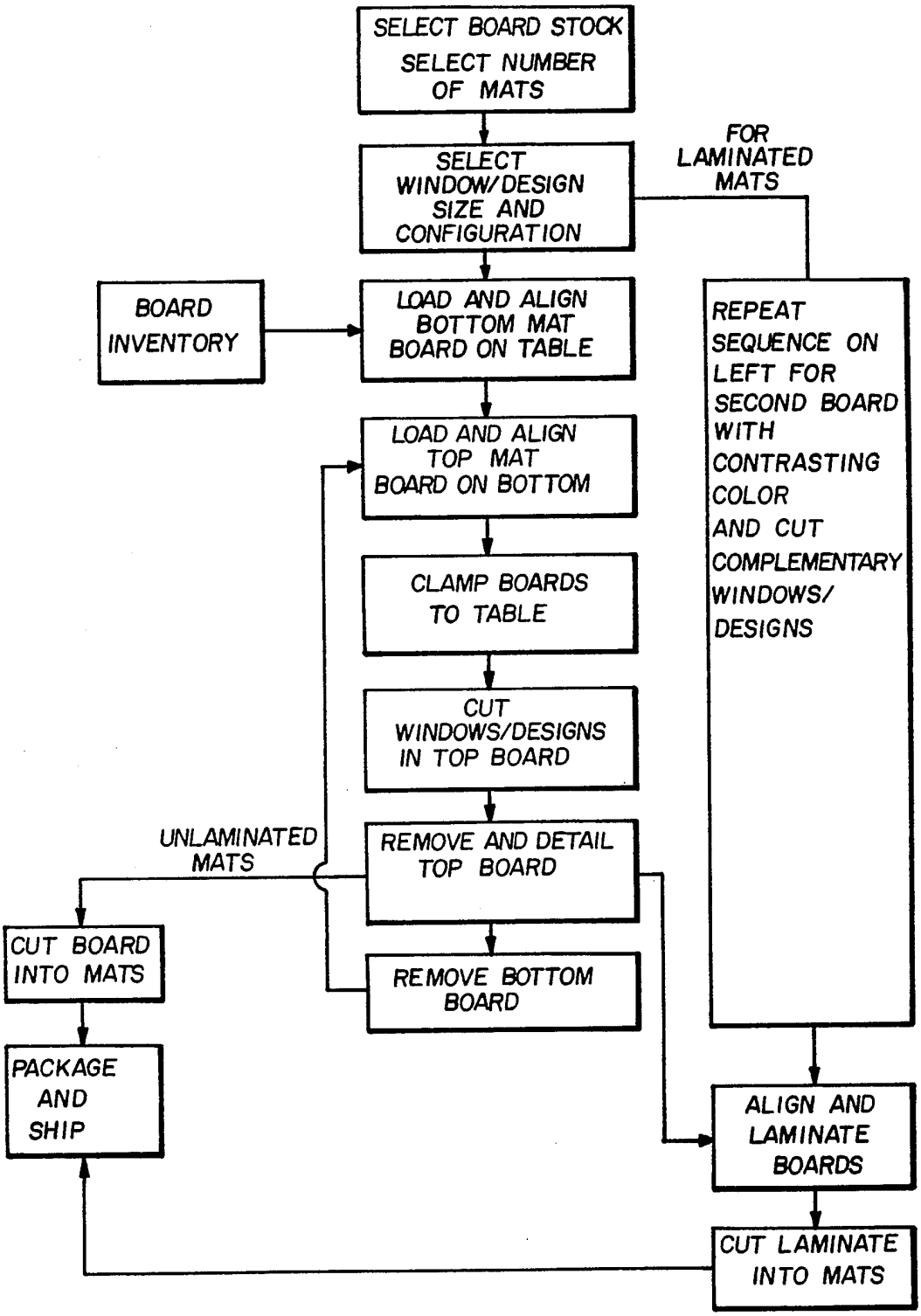
SELECT BOARD STOCK
SELECT NUMBER OF MATS
SELECT WINDOW/DESIGN SIZE AND CONFIGURATION
FOR LAMINATED MATS
BOARD INVENTORY
LOAD AND ALIGN BOTTOM MAT BOARD ON TABLE
REPEAT SEQUENCE ON LEFT FOR SECOND BOARD WITH CONTRASTING COLOR AND CUT COMPLEMENTARY WINDOWS/ DESIGNS
LOAD AND ALIGN TOP MAT BOARD ON BOTTOM
CLAMP BOARDS TO TABLE
CUT WINDOWS/DESIGNS IN TOP BOARD
UNLAMINATED MATS
REMOVE AND DETAIL TOP BOARD
CUT BOARD INTO MATS
REMOVE BOTTOM BOARD
PACKAGE AND SHIP
ALIGN AND LAMINATE BOARDS
CUT LAMINATE INTO MATS

Fig. 7

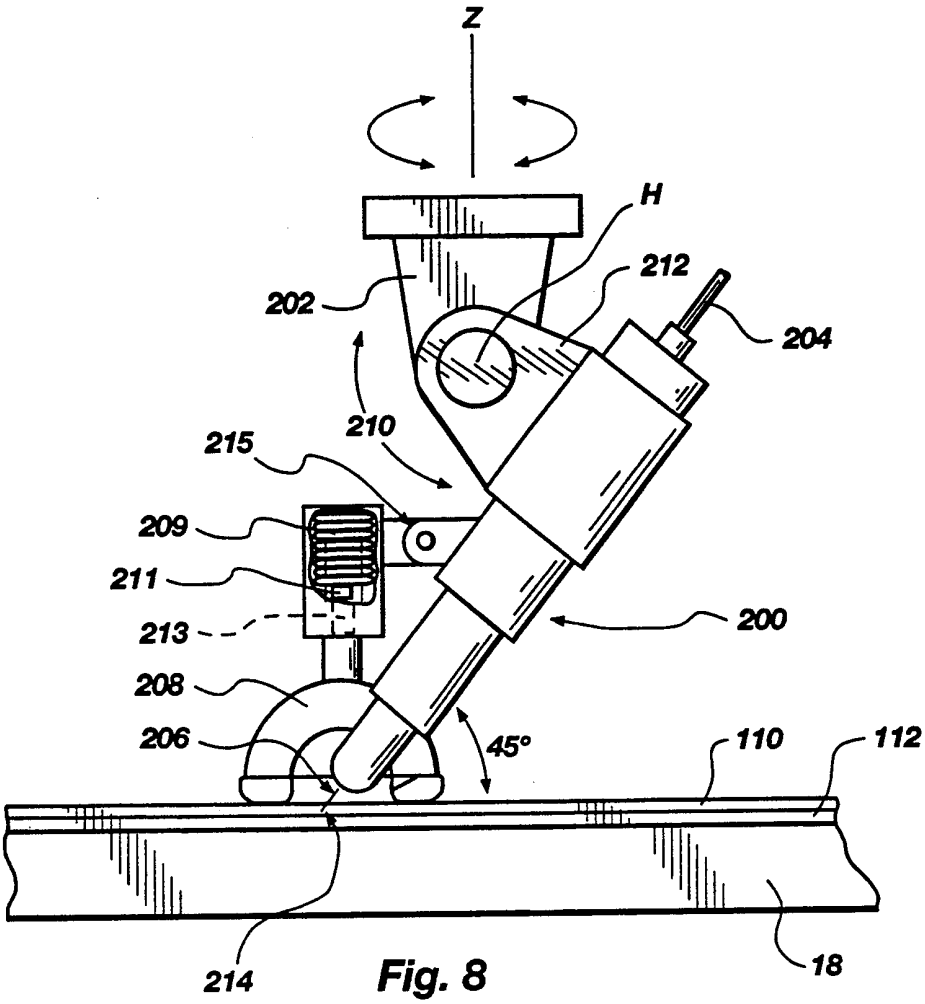
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Fig. 8

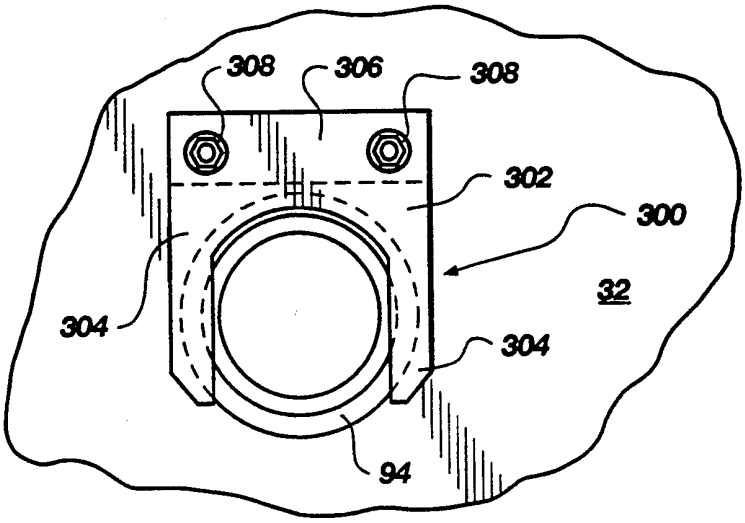
308
306
308
302
300
32
304
304
94

Fig. 9

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,317,943

DATED : 6/7/94

INVENTOR(S) : Barton K. Dowdle

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the title page, under [73], change "Burton" to --Barton--;

In Column 1, line 21, after "stantially" delete the comma;

In Column 1, line 36, before "window" insert --a--;

In Column 2, line 49, after "into" insert --a--;

In Column 3, line 31, insert a period after "FIG";

In Column 3, line 51, insert a period after "FIG";

In Column 4, line 14, change "Fagot" to --Fagor--;

In Column 4, line 22, change "Jig" to --jig--;

In Column 4, line 29, change "30" to --32--;

In Column 5, line 3, change "136" to --138--;

In Column 5, line 21, after "110" insert --be utilized--;

In Column 6, line 41, change "308" to --306--;

In Column 6, line 53, change "52" to --50--;

In Column 7, line 21, after "mat" change "is" to --are--;

In Column 7, line 67, change "accurate" to --arcuate--;

In Column 8, line 2, after "jig" change "as" to --is--;

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,317,943

DATED : 6/7/94

INVENTOR(S) : Barton K. Dowdle

It is certified that error appears in the above-indentified patent and that said Letters Patent is hereby corrected as shown below:

In Column 8, line 24, after "control" insert --22--;

In Column 8, line 50, insert a period after "thereon", delete "as", and change "the" to --The--;

In Column 8, line 51, insert --is-- after "sheet";

In Column 10, line 24, after "provide" delete "a";

In Column 11, line 22, change "Jig" to --jig--;

In Column 12, line 12, after "at" change "a" to --an--;

In Column 12, line 36, change "stop" to --step--.

Signed and Sealed this

Third Day of January, 1995

Attest:

BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks