The present invention relates to a method and means for preparing padded panels and particularly to a method and means for applying a padding of fibres to a cardboard and cutting the assembled sheet to desired shape.

Various methods have been employed heretofore to construct a padded backing element for receiving a trim material to form trim panels for the inner surface of a vehicle body, particularly for the doors thereof. A separate pad was placed on the cardboard and the unit disposed face down on the trim material. The edges of the trim material and cardboard were sprayed with an adhesive material after which the edges of the trim material were drawn over the edges of the cardboard and secured to the rear side thereof.

The same assembled unit is obtained when practicing the present invention which combines various steps to continuously produce padded cardboard assemblies. A Garnett machine arranges a thin layer of combed fibres and distributes the layer over a conveyor belt and onto an adhesive material applied to sheets of cardboard which are advanced on a conveyor disposed thereunder. The layers of fibres are compressed onto the cardboard in a compacted mass and are conveyed to a storage table where pairs of the padded cardboards are stacked together with the padding in face to face relation. The assembly is then delivered to a press where the cardboards are stacked and into desired shape. In this manner a right and left hand padded cardboard is provided for the two sides of a vehicle body.

Accordingly, the main objects of the invention are to apply an adhesive to a backing sheet and deliver a padding material thereon to assemble a pad on a surface of a backing sheet after adhesive material has been applied thereto; to separate continuous padding at portions unsecured to backing sheets as the padding and sheets continuously advance into secured relation; to stack pairs of the padded sheets with the padding in face to face relation; to stamp the stacked sheets between dies of a press to shear the edges of the padding and sheets to shape and to punch holes therethrough, and in general to deliver and assemble fibres to form continuous padding, convey the padding onto adhesive surfaces of spaced advancing backing sheets, sever the padding between the sheets, stack the padded sheets in pairs with the padding in face to face relation, and shear the assembled pairs into desired shape to provide pairs of padded sheets of opposite hand.

Other objects and features of the invention will become apparent when referring, for a better understanding thereof, to the following description taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a side view, in perspective, of an assembly line embodying features of our invention;

Fig. 2 is an enlarged view, partly in section, of a portion of the line illustrated in Fig. 1 with the stacking elements in horizontal position;

Fig. 3 is a view of the structure illustrated in Fig. 2 with the stacking elements in partially folded position;

Fig. 4 is a plan view of a pair of stacked elements with the lines of shear illustrated thereon;

Fig. 5 is a sectional view of the structure illustrated in Fig. 4, taken on the line 5—5 thereof;

Fig. 6 is a plan view of a padded backing element after the trim material has been added thereto, and

Fig. 7 is a sectional view of the structure illustrated in Fig. 6, taken on the line 6—6 thereof.

In the co-pending application of Clarence W. Avery, Serial No. 59,692, filed January 17, 1936, and assigned to the assignee of the present invention, a method and means are disclosed for forming and blanking padded cardboard to be employed as the foundation for a door trim panel. While we mention specifically that the panels are to be employed for trimming doors and the interior of automobile bodies, it is to be understood that many other applications for the assembly will be apparent to anyone skilled in the art and we, therefore, do not limit ourselves to these automobile trim panels.

The present invention pertains to another method and means for carrying out the inventive concept in the above mentioned co-pending application.

Referring to Fig. 1, we have disclosed a plurality of devices in aligned relation which continuously advance cardboard and padding and progressively operate thereon to produce the padded backing elements. The line of devices thus constructed embodies a spraying cabinet for applying adhesive material to one surface of a cardboard. The cardboard is advanced into the spraying device by a manually operated, spring-retracted carrying element and is picked up and advanced therefrom by a conveyor belt. Above the conveyor belt, a conveyor belt is operated to have a plurality of layers of fibres disposed thereon by a Garnett machine. The Garnett machine is well known in the art and embodies means for combining fibres and distributes them on a conveyor belt which is oscillated across the top of the conveyor belt to build up a thickness of fibre layers thereon. The speed of operation of the Garnett machine and the belt regulates the depth of the pile of fibres thus produced.

As the continuous pad of layers of fibre elements is advised from the conveyor belt, it is delivered upon the glue side of the spaced cardboards advanced on the conveyor belt. The
pad portions between the spaced cardboards is torn apart by the separating rolls 16 and 17. The roll 16 is stopped periodically after a padded cardboard has passed thereunder while the roll 17 advances it to thereby tear the padding material apart between adjacent cardboards.

The cardboards with the separated padding material are advanced by the conveyor belts 18 onto a stacking table 19. The stacking table 19 automatically stacks one of the cardboards upon the other with the padding material in face to face relation and advances the cardboard into the dies 21 of the press 22. The dies blank out the cardboard in pairs and thereby provide both a left hand and a right hand panel. A laterally movable table 23 supports a plurality of sets of dies 21 and positions the dies relative to the press 22 so that they may be readily removed and other pairs of dies substituted. In this manner, various shapes and sizes of pairs of panels may be constructed by the single line of devices.

In Figs. 2 and 3, we have illustrated a greatly enlarged view of the stacking table 19 and press 22. Uprights 24 pivotally support a shaft 25 and a pair of arms 26. Track elements 27 are carried by the uprights 24 with the opposite ends supported on the frame 28. The track 27 supports for movement parallel thereto a pair of racks 29. The racks pivotally support a shaft 31 upon which a pair of arms 32 is secured. The arms 32 are pivoted to the arms 26 by a shaft 33. The arms 26 are driven in reciprocation from pinions 34 supported on a shaft 35 and driven through a sprocket wheel 36 by a motor 37 operating through a chain belt 38. The shafts 25, 31 and 33 carry pulleys 39 over which belts 40 are disposed and driven in rotation by the belts 18.

As a pair of cardboards is advanced by the operation of the belts 18 and belts 41, the motor 37 is actuated to cause the racks 29 to be operated away from the press 22 and the arms 32 and 26 relative to each other. When a pair of padded cardboards are advanced upon the table they are stacked in pairs with the padding material in face to face relation.

The motor 37 is, thereafter, automatically reversed to move the rack toward the press 22 and the arms 32 and 26 into substantially horizontal relation. Thereupon the operation of the belts 41 causes the unit to advance onto the conveyor belts 43 to a position adjacent to the dies 21 of the press. A carriage 44 is mounted to operate in tracks 45 to be actuated by a projecting arm 46 advanced in the carriage by a pin and slot connection. Projecting fingers 47 and 48 on the carriage are raised and lowered therewith by the operation of links 49 as the carriage is advanced and retracted relative to the press, respectively. This raises the stacked sheets from the belts 43 and returns by the fingers 47 advances them into the press. During the movement of the rack 29 away from the press 22, the links 49 operate to lower the carriage 44 and the fingers 47 and 48, the opposite movement causes them to be raised. During the movement of the carriage toward the press the fingers 48 are available to push the trimmed elements and material therefrom onto a conveyor belt carried by the table 23 as a new pair of elements are moved between the dies.

In Fig. 4, we have illustrated one of a pair of the assembled padded cardboards before being stamped by the dies. The backing element 51 of cardboard or other material has the padding material 52 secured thereon. The elements are shown in stacked relation with the padding material in face to face relation with the cardboard on the top and bottom of the assembly. The dies are of the well known type formed of male and female punch elements and mating knife edges which punch out holes 54 and cut along the line 55 respectively. The dies are also disposed to cut on the lines 55 to sever the remaining border so that it may be readily removed from the formed padded elements 56.

In Figs. 6 and 7, the formed padded element 56 is illustrated after being covered by a trim material 57. The trim material is stretched across the padded face of the element 56 with its edges pasted to its opposite face. This is preferably accomplished by a method and means illustrated in the patent to Alfred H. Haberstump, No. 2,056,451, issued April 6, 1938, and assigned to the assignee of the present invention.

To accurately control the operation of the stacking table 19 after the passage of a pair of padded cardboards 51 thereon, a photo-electric cell 58 may be provided to retain the electric circuit to the motor 57 in open position so long as a light 59 is directed thereon in the well known manner. As soon as a pair of sheets has been advanced upon the stacking belts 41, the most advanced sheet will intercept the rays from the light 59 and thereby permit the circuit to the motor to be energized. The motor will operate to drive the rack 29 and fold the elements one upon the other and return the stacking elements to horizontal position after which the stacked assembly will pass onto the belts 43 while intercepting the rays of light to the cell 58. Thereafter the rays striking the cell will retain the circuit in set position, ready to be completed when the rays are again intercepted.

While we have illustrated and described but a single embodiment of our invention it will be apparent to anyone skilled in the art that various changes, omissions, additions and substitutions may be made therein without departing from the spirit and scope of our invention, as set forth in the appended claims.

We claim as our invention:

1. Apparatus for simultaneously forming right and left hand trim panels which includes a blanking press, means for feeding a pair of trim panels serially toward said blanking press, conveyors serving automatically to arrange said trim panels in superimposed face-to-face relation and means for feeding said panels to said blanking press while thus arranged.

2. Apparatus for forming padded inner trim panels including the fingers 47, means for feeding a pair of padded backing sheets serially toward said blanking press, mechanism for lowering the rearward end of the forward backing sheet and the forward end of the rearward backing sheet to dispose these padded backing sheets in superimposed relation with the padded surfaces thereof face-to-face and means for feeding said padded backing sheets while thus arranged to said blanking press.

CLARENCE W. AVERY.
ALFRED H. HABERSTUMP.