

June 10, 1930.

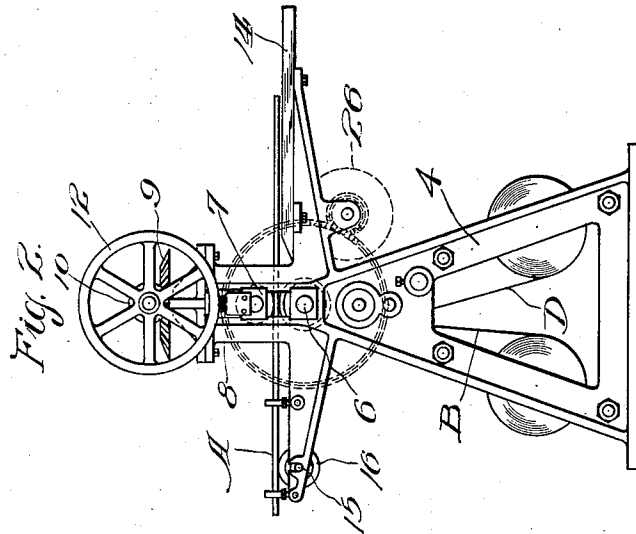
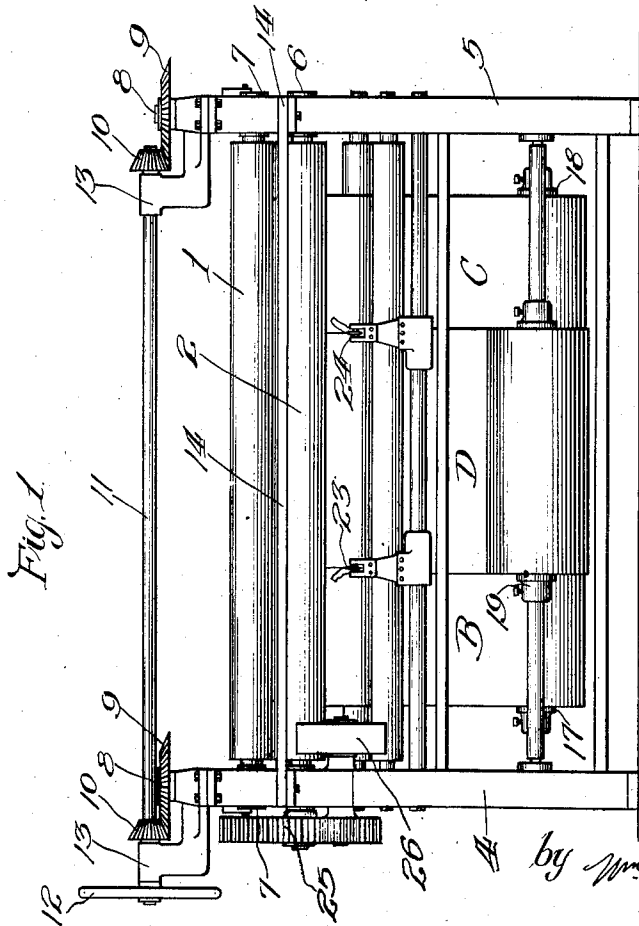
A. ELMENDORF

1,763,227

METHOD OF AND APPARATUS FOR FACING PANELS WITH METAL

Filed Sept. 22, 1924

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

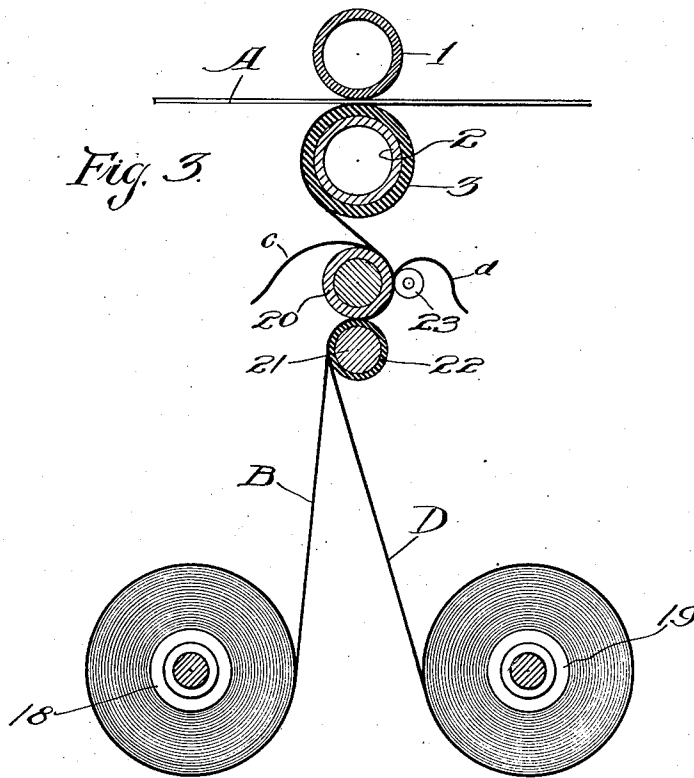


Fig. 4.

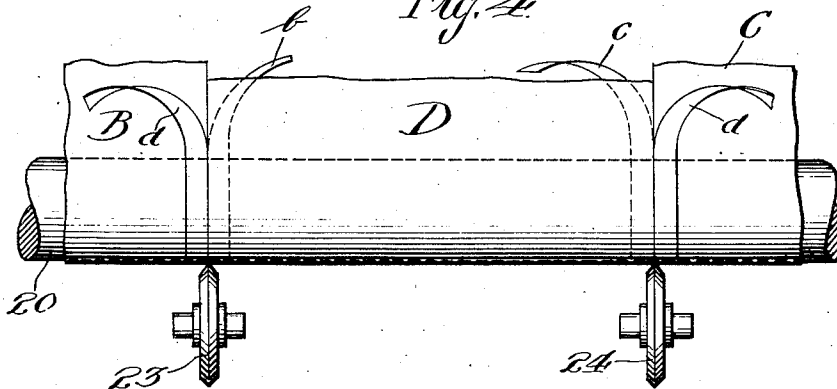
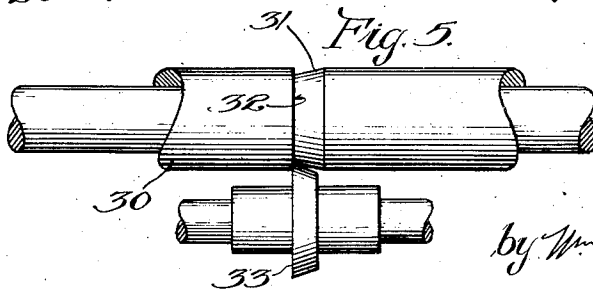


Fig. 5.



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METHOD OF AND APPARATUS FOR FACING PANELS WITH METAL

Application filed September 22, 1924. Serial No. 739,236.

In my Patent No. 1,550,065, I have disclosed a process of sheathing panels of plywood or fibre board with very thin sheet metal, whereby large surfaces may be covered with a plurality of metal sheets arranged edge to edge and yet have the appearance, when finished, of being provided with a continuous sheathing. As explained in the aforesaid application, the joints between the metal sheets may be either butt joints or lap joints.

Viewed in one of its aspects, my invention may be said to have for its object to produce a simple and novel method of and apparatus for facing a panel with a plurality of thin metal sheets abutting against each other at their edges in such a manner as to produce practically invisible joints.

It is necessary that the metal be perfectly glued to the panel at every point in the covered surface in order that the sheathing may form a true skin for the panel. Viewed in one of its aspects the present invention may be said to have for its object to produce a simple and novel method of and apparatus for effectively and economically gluing thin metal sheets to boards or panels, regardless of inequalities in thickness or other characteristics of the materials on which the work is being done.

Not only must the metal be perfectly glued to the panels, but any superficial irregularities must be reduced so as to give a perfectly smooth surface. Viewed in another of its aspects, the present invention may be said to have for its object to produce a simple and novel method of an apparatus for bringing about a smooth compacted surface finish on metal sheets glued to panels or boards.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a front view of a machine designed to carry out the present invention; Fig. 2 is an end view of the machine; Fig. 3 is a diagrammatic view showing the various

spools, rolls and cutters on a plane at right angles to Fig. 1; Fig. 4 is a detail of the cutters and the cooperating roll in the act of trimming sheets passing through the machine and Fig. 5 is a detail showing a fragment of a modified cutting mechanism.

In the drawings I have illustrated a machine in which my improved method may successfully be carried out, the machine being designed to sheath a panel or board with three strips or sheets of metal arranged side by side; and, for the sake of brevity, I shall confine the detailed description to this particular exemplification.

Referring to Figs. 1 to 4 of the drawings, 1 and 2 represent two long horizontal rolls, their lengths being greater than the widest panel to be operated upon. One of these rolls has preferably a hard steel surface while the other is provided with a superficial cushioning layer such as rubber. These rolls are arranged one above the other, the upper roll 1 having the hard surface and the lower roll 2 being covered with a cushioning layer 3. These rolls are rotatably supported in a suitable frame comprising two heavy end members 4 and 5 suitably cross-connected. The lower roll is supported in suitable stationary bearing blocks 6 and the upper roll is journaled at its ends in vertically moving bearing blocks 7. Vertical shafts 8 are screwed into the tops of the bearing blocks 7 so that, upon rotating these shafts, the bearing blocks may be raised and lowered, thus varying the distance between the two rolls to accommodate stock of different thicknesses. On the upper end of each screw shaft is fixed a beveled gear wheel 9 that meshes with a pinion 10 secured to a transverse shaft 11 having on one end a hand wheel 12, the shaft 11 being rotatably supported on suitable bearing brackets 13. It will be seen that by turning the hand wheel in one direction or the other, the upper roll may be raised or lowered, as desired. On one side of the frame is fastened a shelf or platform 14 whose upper surface is approximately tangent with the top of the lower roll 2. On the opposite side of the frame is loosely supported a horizontal transverse shaft 15 having thereon a

plurality of wheels or discs 16, of which only one is shown; these wheels or discs having sharpened peripheries so as to make only line contacts with work supported thereon. A panel, such as indicated at A, suitably coated with glue on its under surface, is laid on the wheels or discs 16 and pushed forward between the rolls 1 and 2, the sheathing being applied during the passage of the panel between the rolls, and the finished product being received on the shelf or table 14.

The sheathing is in three long strips B, C and D. The strips B and C are wound on spools 17 and 18 coaxial with each other and spaced apart from each other a distance somewhat less than the width of the strip D. These spools are mounted in the lower portion of the machine so that they may be rotated by a pull on the sheets or strips wound thereon. The sheet or strip D is mounted on a spool 19 lying opposite the gap between the inner ends of the spools 17 and 18 and also supported in the frame so as to be free to rotate. It will be seen that if the metal strips are unwound from their spools and carried up between the rolls 1 and 2 underneath a panel, the rolls, if properly driven, will unroll the strips from the spools and press them into contact with the under side of the panel as the panel travels through the machine, thus gluing the strips to the panel. However, the central strip slightly overlaps the adjacent edges of the other two strips and therefore if the strips were applied to the panel in the condition in which they leave the spools, there would be lap joints between the strips on the panel. Such lap joints would be avoided if the strips were delivered edge to edge but, in practice, it is impossible so accurately to form the strips that they will fit together at all points if simply fed through the machine, and it is for this reason that I so arranged them that they will overlap somewhat, in order that cutting operations may be performed on them as they approach the panel and thus cause them to be delivered against the panel with their edges in perfect contact. In the arrangement shown, the several strips pass between two rolls 20 and 21 lying below and parallel with the rolls 1 and 2. The roll 20 has a hard steel surface while the roll 21 has a cushioned periphery, conveniently produced by covering it with a layer 22 of rubber or the like. Engaged with the roll 20 are two cutting wheels 23 and 24 so disposed that each engages the central strip between an edge of the latter and the adjacent edge of the corresponding overlapping strip. Assuming the roll 20 to be suitably driven and the cutters to be tightly pressed against the same, it will be seen that as the three overlapping strips pass over the roll 20, two cuts are made entirely through the two overlaps, a narrow piece being severed from each margin of the central

strip, as indicated at *d*, in Fig. 4, and similar narrow pieces, as indicated at *b* and *c* being cut from the inner marginal portions of the strips B and C; with the result that the trimmed strips leave the cutting roll engaged edge to edge and pass to the panel in this condition. The strips cannot be displaced relatively to each other in their passage from the cutting point to the gluing point and therefore the edges of the three strips make perfect contact with each other as the strips are engaged with the panel, and the joints are, for all practical purposes, invisible.

The rolls 1 and 2 are positively driven in unison with each other through suitable gearing 25 set in motion from a driving pulley 26 or other primary power device, the roll 20 being rotated, either positively or through adhesion between it and the strips or sheets.

The cushion on the roll 21 compensates for the inequality in thickness of the work passing it due to the overlapping of the strips, whereas the cushion on the roll 2 compensates for inequalities in the thickness of the panel that is being sheathed. There are always slight irregularities in commercial stock and therefore, if both the rolls 1 and 2 were made of steel or other hard material, perfect gluing of the sheathing upon the panel could not be procured. By making one of the rolls, preferably the one in contact with the metal sheathing, yieldable, the sheathing will be pressed against low spots as well as against high spots on the panel.

I have found that much better results are obtained by rolling the sheathing upon a panel than is possible by the use of plates or presses, this being probably due to the fact that the pressure is applied in a progressive manner along one line or narrow area after another, making the effective pressure at each point very considerable and squeezing the glue, if there be an excess, outwardly in the opposite direction from that in which the work is traveling. This squeezing of the glue will also insure that any imperfectly coated spots will receive glue from points in advance where there may have been an excess.

After a panel has passed through the machine I prefer to roll the metal face with a hard roll to compact and smooth the surface of the metal. This could be accomplished by turning the panel upside down and running it through the machine just described without feeding the metal strips, or the panels may be run through a separate machine.

Instead of cutting the overlapping strips by means of a wheel having a sharp peripheral edge engaging the surface of a cylindrical roll, the cutting may be done by a shearing device. Thus, as shown in Fig. 5, the roll 30, corresponding to the roll 20, may have a groove 31 extending around the same and provided at one side with a square face

or shoulder 32. The cutting wheel 33 is a short frustrum of a cone the base of which rests against said shoulder or face 32. As the work is fed between the wheel and the roll it is trimmed by a true shearing action.

While I have illustrated and described with particularity only a single preferred form of my invention, with a slight modification, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. The method of sheathing a panel with very thin sheet metal, which consists in coating a face of the panel with glue, placing a plurality of strips of such metal side by side with their side marginal portions overlapped, cutting said strips along longitudinal lines lying within the areas of said overlapped portions, and feeding the trimmed strips and the panel through pressure rolls with the strips in contact with the glued surface of the panel.

2. The method of trimming and delivering a plurality of thin metal sheets which consists in feeding said sheets longitudinally with their side marginal portions overlapping, and cutting through the overlapped portions along longitudinal lines.

3. The method of trimming and delivering a plurality of thin metal sheets which consists in feeding said sheets longitudinally with their side marginal portions overlapping, cutting through the overlapped portions along longitudinal lines, and preventing relative longitudinal displacement of the sheets before they reach their destination.

4. The method of sheathing a panel with thin sheet metal, which consists in drawing a plurality of such metal sheets from spools so located that the sheets are caused to overlap at their side margins as they are drawn off, cutting the sheets through the overlaps to cause the trimmed sheets to abut edge to edge, and applying the trimmed sheets to the panel to be sheathed.

5. In a machine of the character described, a frame, a plurality of spools rotatably mounted in the frame so as to overlap each other somewhat at their ends, means for drawing thin metal sheets from said spools and holding them in contact with each other with their side marginal portions overlapping, and means for cutting through the overlapped portions of said sheets to trim the sheets and cause them to engage each other edge to edge.

6. In a machine of the character described, a frame, a plurality of spools rotatably mounted in the frame so as to overlap each other somewhat at their ends, means for drawing thin metal sheets from said spools and holding them in contact with each other with their side marginal portions overlap-

ping, means for cutting through the overlapped portions of said sheets to trim the sheets and cause them to engage each other edge to edge, and means for applying the trimmed sheets to the face of a panel to be sheathed without displacing the sheets relatively to each other.

7. In a machine of the character described, a frame, a plurality of spools rotatably mounted in the frame out of alignment with each other and with their ends overlapping somewhat, a pair of feed rolls for drawing thin metal sheets from said spools with their side marginal portions overlapping, and means cooperating with one of said rolls to cut through the overlaps in the sheets and trim the sheets to cause them to abut edge to edge.

8. In a machine of the character described, a frame, a plurality of spools rotatably mounted in the frame out of alignment with each other and with their ends overlapping somewhat, a pair of feed rolls for drawing thin metal sheets from said spools with their side marginal portions overlapping, means cooperating with one of said rolls to cut through the overlaps in the sheets and trim the sheets to cause them to abut edge to edge, and pressure rolls for applying the trimmed sheets to a panel to be sheathed.

In testimony whereof, I sign this specification.

ARMIN ELMENDORF.