

March 16, 1954

L. C. REED

2,671,990

APPARATUS FOR MANUFACTURING WALLBOARD JOINT TAPE

Filed May 1, 1950

3 Sheets-Sheet 1

Fig. 2.

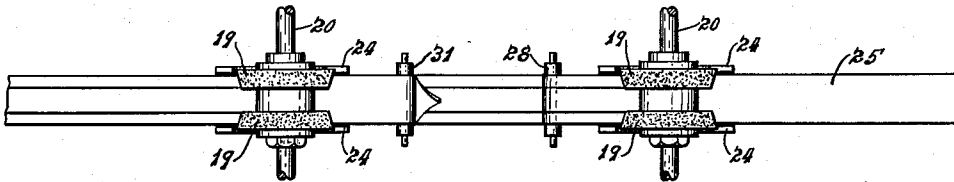
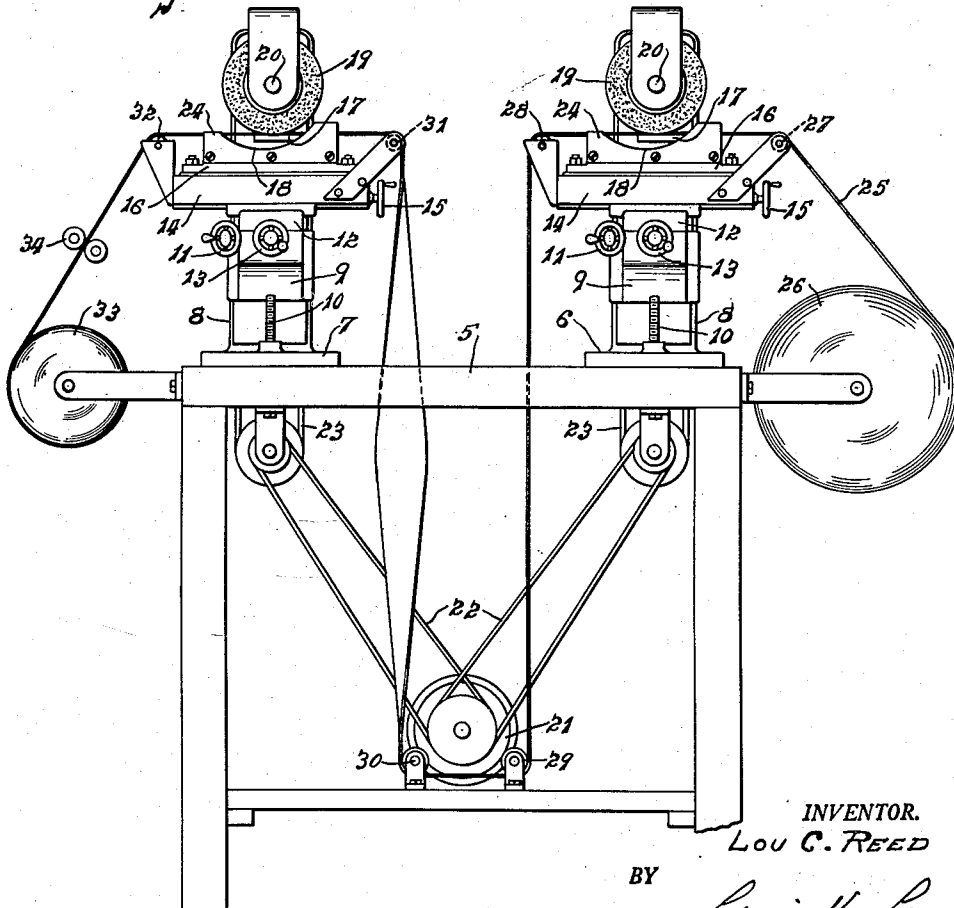


Fig. 1.



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3 Sheets-Sheet 2

Fig. 3.

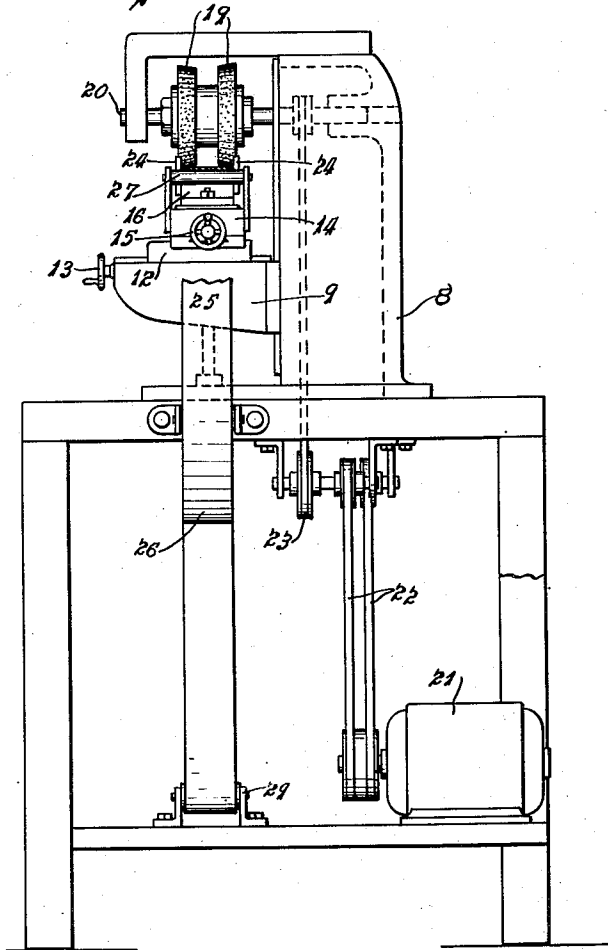


Fig. 4.

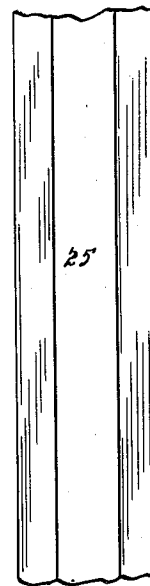


Fig. 5.

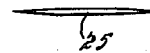
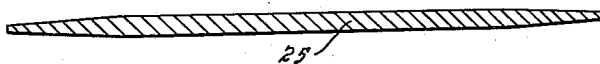


Fig. 13.



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3 Sheets-Sheet 3

Fig. 6.

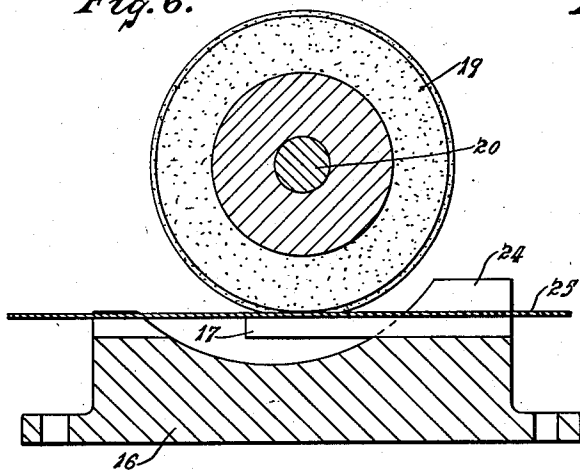


Fig. 7.

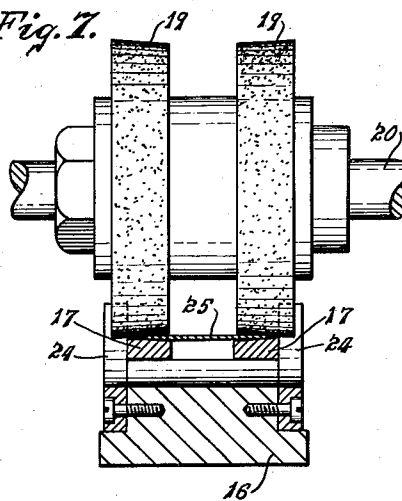


Fig. 8.

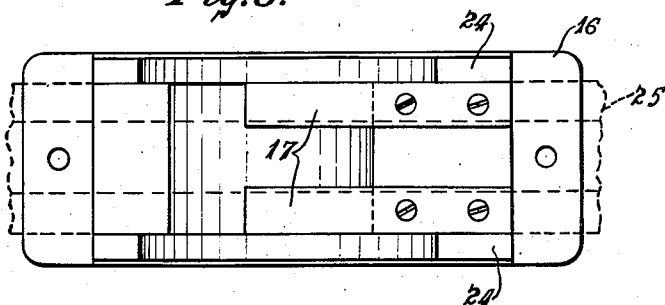


Fig. 9.

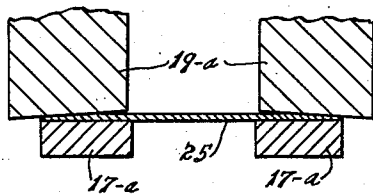


Fig. 10.

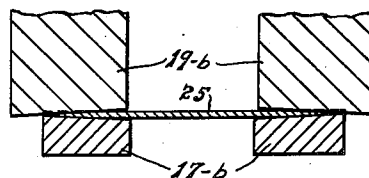
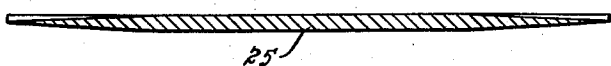


Fig. 11.



Fig. 12.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR MANUFACTURING
WALLBOARD JOINT TAPE

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9 Claims. (Cl. 51-75)

1

This invention relates to apparatus for manufacturing wall board joint tape and more particularly to an apparatus for bevelling or feathering the edge portions of tape such as of paper or the like.

Such tapes are commonly used to cover the joints of wall boards and they are preferably bevelled, or feathered, so that they may be provided with thin free edges to more effectively obscure the joint and also to prevent cracking of the wall paint or other finish which is applied over the surface thereof and over the tape for covering the joint.

It is an object of the present invention to provide an apparatus which will bevel, or feather, the longitudinal edge portions of such tapes in a highly efficient and economical manner.

It is a further object of the invention to provide an apparatus wherein the thickness of the thin free edge produced on the tape may be accurately controlled.

A further object is to provide an apparatus wherein the tape is positioned in its normal condition during the bevelling operation so as to permit positive control of said operation regardless of any variation in the characteristics of the tape material.

Further objects and advantages of this invention will be more clearly understood from the following description and from the accompanying drawing in which:

Fig. 1 is a front view of a tape bevelling apparatus embodying the present invention.

Fig. 2 is a plan view illustrating the arrangement of the grinding wheels with relation to the tape as it is run through the said apparatus.

Fig. 3 is a side view of the apparatus.

Fig. 4 is a plan view showing a piece of the tape which has been bevelled in the said apparatus.

Fig. 5 is an end view of said tape.

Fig. 6 is an enlarged front view, in central vertical section, through one of the grinding units.

Fig. 7 is an end view thereof, partly in central vertical section.

Fig. 8 is a plan view of the tape supporting shoes and the block on which said shoes are mounted.

Fig. 9 is a further enlarged view showing the preferred construction of the tape supporting shoes and the positioning of the tape thereby for the first bevelling operation.

Fig. 10 is a similar view showing the construction of the shoes and the positioning of the tape for the second bevelling operation.

Fig. 11 is a still further enlarged view illustrating the first grinding operation.

2

Fig. 12 is a sectional end view of the tape when in reversed position for the second bevelling operation.

Fig. 13 is a similar view showing a tape with 5 free edges of a definite thickness.

In the embodiment illustrated in the drawings, my improved apparatus preferably comprises a table 5 upon which is supported a pair of spaced substantially similar bevelling, or grinding, units including a first unit 6 and a second unit 7 for bevelling the opposite sides of the tape. Each of these units, as shown, comprises a vertical supporting frame 8 having a carrier 9 thereon which is vertically adjustable on said frame by means of an adjusting screw 10 that is operated by a hand wheel 11.

The said carrier has slidably mounted thereon a bed plate 12 that is horizontally slidable on the carrier and adjustable thereon by means of a screw which is rotated by the hand wheel 13.

A table 14 is horizontally slidable on the plate 12 and adjustable thereon by means of a screw (not shown) which is operated with the hand wheel 15 and a supporting block 16 is mounted on said table and carries a pair of tape supporting shoes 17 which are secured at one end thereof to said block. The said shoes extend over a recess 18 and are adapted to support the tape in position to be contacted by a pair of grinding wheels 19 on a shaft 20 that is rotatably mounted in the frame 8 and driven by a motor 21 through driving belts 22 and 23.

A pair of guide plates 24-24 are secured to the opposite sides of the block 16 and extend upwardly therefrom to provide guides for retaining the tape in position upon the shoes 17 as it is moved between the said shoes and the grinding wheels.

As illustrated in Fig. 7, each of the shoes 17 is bevelled downwardly towards the center of the tape and each of the grinding wheels 19 is bevelled upwardly towards said center, so as to provide the desired included angle of bevel on the opposite longitudinal edge portions of the tape by the grinding operation performed thereon with said wheels as the tape is moved through the apparatus.

In bevelling the tape by the operation illustrated in Fig. 7, the said tape, which is indicated at 25, is taken from a roll, indicated at 26, that is mounted at one side of the apparatus. The tape is passed over a suitable guide roller 27, on the first grinding unit, and then passed over the shoes 17 thereof where it is contacted by the rapidly rotating grinding wheels 19 which bevel edge portions on the top side of the tape

3

as it passes through the said first bevelling unit. The tape then passes over a roller 28 and moves downwardly, around a roller 29, and then horizontally around a roller 30. The said tape is then twisted for a half turn so that it is reversed. It then passes over a roller 31 of the second unit and therefrom over the shoes 17 of said unit while the side of the tape opposite to that bevelled by the first bevelling unit is now operated upon and bevelled by the grinding wheels of the second unit. The tape then passes over the roll 32 onto a roll of the completed tape which is indicated at 33.

It will be understood from the above description that one side of the tape is bevelled first as it passes through the first bevelling unit and that the tape is then reversed and the opposite side is then bevelled as it passes through the second bevelling unit.

The grinding wheels of the first unit are adjusted with relation to the shoes 17 thereof so that only one-half of the amount of grinding is done upon the edge portions of one side of the tape. The other half of the grinding is done upon the opposite side of the tape as it passes through the second bevelling unit. This provides a tape having opposite edge portions which are bevelled from both sides of the tape. If desired, the grinding wheels may be adjusted with relation to the shoes 17 so that all of the grinding may be done on one side of the tape as it passes through the first unit, in the position illustrated in Fig. 7, and this will also provide a thin free edge along the opposite sides of the tape but said tape will be bevelled only on one side.

The tape may be moved through the apparatus either by rotating the completed roll 33 by suitable means (not shown), or by providing a pair of power-driven feed rolls, as indicated at 34, which will pull the tape through the apparatus at a constant rate of speed.

In order to permit a more accurate control of the bevelling operation and to avoid the necessity of distorting the tape as it passes between the grinding wheels and the shoes, I may form the shoes for the first and second bevelling units as indicated respectively in Figs. 9 and 10. In these figures, the first grinding unit is provided with shoes 17-a having supporting surfaces which are perfectly straight so that the straight unbevelled side at the bottom of the tape will be supported in its normal form and without distortion. The grinding wheels 19-a of said first unit are bevelled for the amount of bevel desired upon the sides of the tape. Therefore, as the tape passes through the first unit, it is supported by the shoes in a transversely straight position and the edge portions of the upper side thereof are ground to produce a bevel conforming to the bevel of the grinding wheels. The second bevelling unit, which is illustrated in Fig. 10, is provided with the supporting shoes 17-b which are bevelled upon their upper sides at an angle that conforms with the bevel produced upon the tape by the first bevelling unit. Therefore, when the tape is reversed and enters the second bevelling unit, as illustrated in Fig. 1, the previously bevelled sides thereof will rest upon the bevelled surfaces of the shoes 17-b while the grinding wheels 19-b of the second unit, which are bevelled similarly to the wheels 19-a of the first unit, will bevel the previously opposite side of the tape which is now upon the upper side thereof and thereby produce bevelled edges with an equal

4

amount of taper on the opposite sides of the tape.

The manner in which the first and second bevelling operations are performed by the operation of the tape is clearly illustrated in Figs. 11 and 12 of the drawings.

It will be understood that the thickness of the free edge of the tape may be controlled by adjusting the supporting shoes with respect to the grinding wheels so that a free edge of any desired thickness may be produced.

It has been found that a tape having a bevelled edge portion terminating in a free edge of definite thickness is preferred over a tape with a feathered edge which ends in a sharp and uneven free edge. This is for the reason that, when the feathered edge absorbs the adhesive, or the paint which is applied over the tape, it becomes wrinkled so that it rises in some portions and thereby causes cracks and prevents a clean and invisible joint while a tape with free edges of definite thickness is capable of absorbing moisture from the adhesive or paint without the said edges becoming wrinkled and, therefore, permits a smooth application of the paint over the edge and the tape and provides a clean and practically invisible joint.

A tape having such a free edge of definite thickness is illustrated in Fig. 13 of the drawings and it will be noted therefrom that such a tape may be produced by merely adjusting the supporting shoes with relation to the grinding wheels so that less material will be ground from the edge portions of the tape during the grinding operation and thereby provide a free edge of a predetermined thickness. This may be accomplished without altering the angles of the bevel on the grinding wheels and the supporting shoes and by merely spacing the surfaces of the shoes from the surfaces of the grinding wheels so that less material will be ground off the tape and a narrower bevelled edge portion and thicker free edge will result.

It has been found that for conventional paper tapes, which are usually of a thickness approximating .008 inch, a free edge having a thickness of approximately one-half of the thickness of the tape is preferred as this will provide a free edge which is sufficiently thin to produce a practically invisible joint and still of sufficient thickness to prevent it from curling or wrinkling.

I claim:

1. Apparatus for bevelling the longitudinal edge portion of tape comprising a grinding wheel having a bevelled grinding surface conforming with the bevel to be formed thereby upon the tape, a stationary shoe having an oppositely bevelled supporting surface adjacent to the wheel for supporting the tape in contact with the wheel during a bevelling operation, means for varying the position of said shoe relatively to the grinding surface to predetermine the degree of thickness of the free edge of the bevelled portion of said tape, and means for moving the tape over said shoe.

2. Apparatus for bevelling the longitudinal edge portion of tape to provide a thin free edge, said apparatus comprising a grinding wheel having a bevelled grinding surface conforming with the bevel to be ground in the tape, a stationary supporting shoe having a surface adjacent to and disposed at an angle to the said bevelled grinding surface for supporting a tape with the edge portion thereof in contact with said grinding surface, guide means at opposite sides of

5

said shoe for guiding the tape thereover, and means for moving the tape over said shoe.

3. Apparatus for bevelling the opposed edge portions of tape to provide relatively thin free edges, said apparatus comprising a pair of grinding wheels having oppositely bevelled grinding surfaces conforming to the bevels to be ground at the opposite sides of the tape, a pair of spaced shoes for supporting said tape with the opposite side portions thereof in contact with said grinding surfaces, guide means adjacent each shoe for guiding the tape over said shoes and relatively to the grinding surfaces during the movement of the tape through said apparatus, means for varying the distance between the shoes and the grinding surfaces to vary the thicknesses of the free edges of the bevelled portions of the tape, and means for moving the tape over said shoes.

4. Apparatus for bevelling the opposite longitudinal edge portions of tape to provide relatively thin free edges on said tape, the said apparatus comprising a pair of grinding wheels having spaced grinding surfaces oppositely bevelled to conform with the bevels to be ground thereby in the tape, a stationary supporting shoe adjacent to each of said grinding surfaces and having a supporting surface disposed at an angle to the grinding surface and conforming to the degree of bevel to be ground in the tape for supporting the said tape in contact with the grinding surface, guide means adjacent each of said shoes for guiding said tape over said shoes during the movement of the tape through the apparatus, and means for varying the distance between the shoes and the grinding surfaces for controlling the thicknesses of the free edges of the bevelled portions of the tape.

5. Apparatus for bevelling the longitudinal edge portions of tape comprising a pair of grinding wheels having spaced oppositely bevelled grinding surfaces, a supporting shoe adjacent to each of said grinding surfaces for supporting the edge portions of a tape in contact with said grinding surfaces and in a position wherein the free edges of the tape are overlapped by the grinding surfaces, guide plates adjacent to the opposite outer sides of the shoes for guiding the tape thereon, means for adjusting the shoes relatively to the grinding surfaces for controlling the degree of thickness of the free edges of the bevelled portions of the tape, and means for moving the tape through said apparatus.

6. Apparatus for bevelling the opposite longitudinal edge portions of a tape to provide relatively thin free edges on said tape; said apparatus comprising a first grinding unit including spaced grinding wheels having peripheral grinding surfaces bevelled in opposite directions, a supporting block adjacent to said wheels, a pair of spaced shoes on said block supported thereby adjacent to said grinding surfaces to support the edge portions of the tape in contact with the grinding surfaces for bevelling operations upon one side of the tape, and a second grinding unit similar to the first grinding unit but having supporting shoes with bevelled surfaces conforming to the previously formed bevelled surface on one side of the tape and supporting the tape in normal condition with the reverse side thereof in contact with the grinding surfaces for bevelling operations upon the reverse side of the tape.

6

7. Apparatus for bevelling longitudinal edge portions of tape to provide relatively thin free edges on said tape, the said apparatus including a first grinding unit comprising a pair of spaced grinding wheels having oppositely bevelled peripheral grinding surfaces conforming to the bevels to be ground thereby in the tape, a supporting shoe extending under each of said wheels inside of the outer edge thereof; each of said shoes having a straight surface for engaging the straight unbevelled surface on one side of the tape and supporting the tape in engagement with said grinding surfaces for bevelling the opposite edges thereof, and a second grinding unit spaced from the first unit for bevelling the edges of said straight side of the tape, the said second grinding unit including a spaced pair of grinding wheels similar to the grinding wheels of the first unit and a shoe adjacent to each of said wheels having an angled supporting surface conforming to the bevel formed in the tape by the first unit for engaging the said bevelled surface and supporting the tape in contact with the said grinding surfaces for a bevelling operation upon the straight side of the tape.

8. Apparatus as set forth in claim 7 including means between the first and second grinding units for reversing the tape before it enters the second unit.

9. Apparatus for bevelling the opposite longitudinal edge portions of paper tape to provide relatively thin free edges on said tape, the said apparatus comprising a bevelling unit including a pair of spaced grinding wheels having oppositely bevelled peripheral grinding surfaces, a supporting block positioned adjacent to said wheels, a pair of spaced supporting shoes mounted on said block and supported thereby relatively to said grinding surfaces and inside of the outer edges thereof, a pair of spaced guide plates mounted on said block and abutting the outer sides of the supporting shoes to position the tape upon said shoes with the edge portions of the tape entirely supported by said shoes and the grinding surfaces overlapping the free edges of said portions, means for adjusting said block to vary the distance between the shoes and the grinding surfaces for predetermining the thicknesses of the free edges of the tapered portions, a separate bevelling unit for similarly bevelling the reverse side of the tape, and means for moving the tape through said bevelling units.

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