Oct. 25, 1960 B. CARMICHAEL 2,957,449

APPARATUS FOR APPLYING JOINT CEMENT TO SEAM TAPE AND FEEDING THE LATTER IN FLAT OR FOLDED CONDITION

Filed March 2, 1959 2 Sheets-Sheet 1

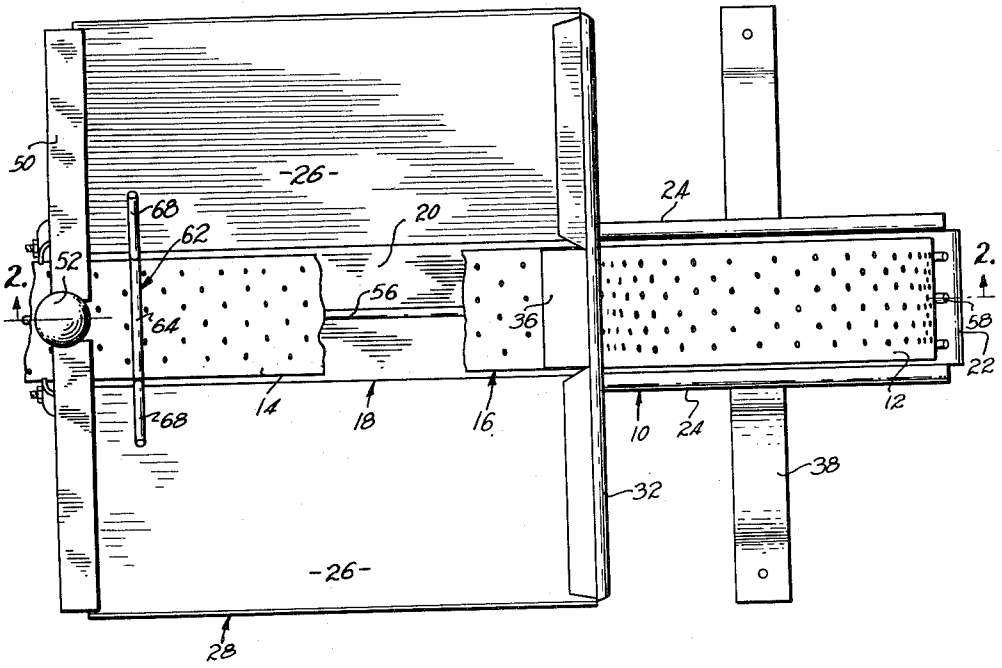


Fig. 1.

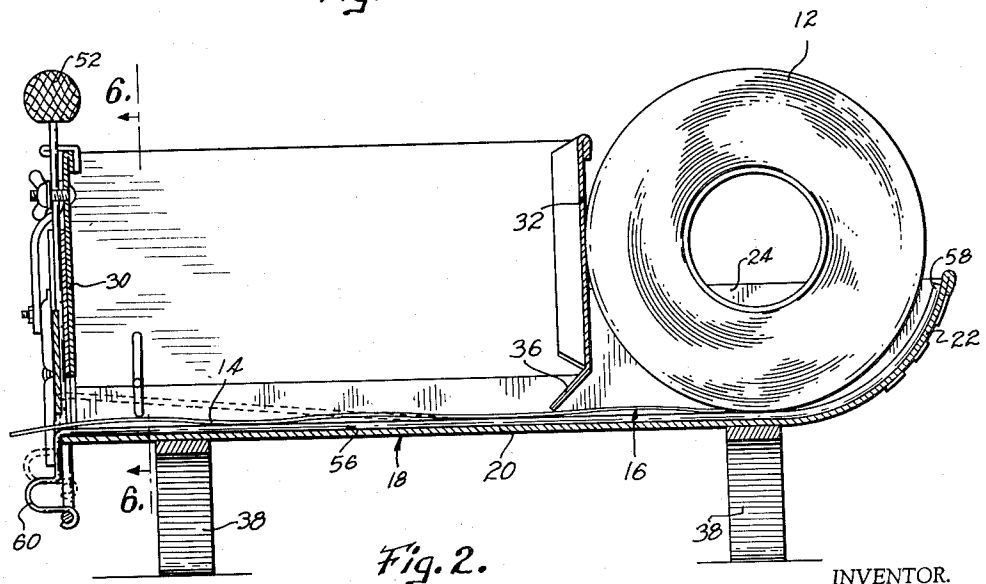


Fig. 2.

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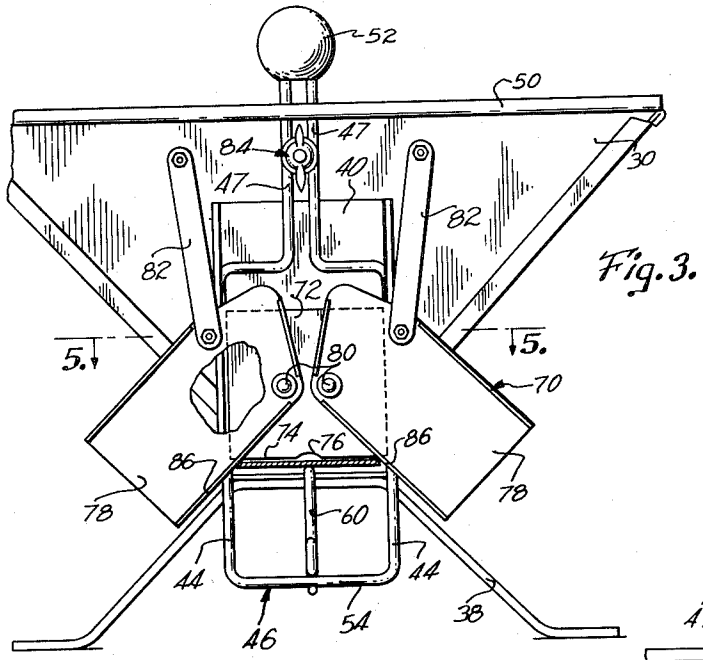


Fig. 3.

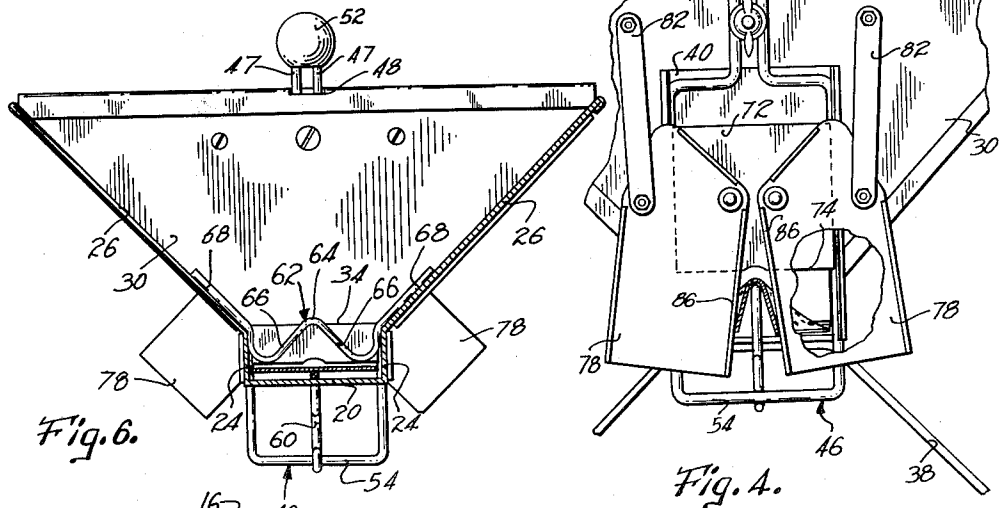


Fig. 6.

Fig. 4.

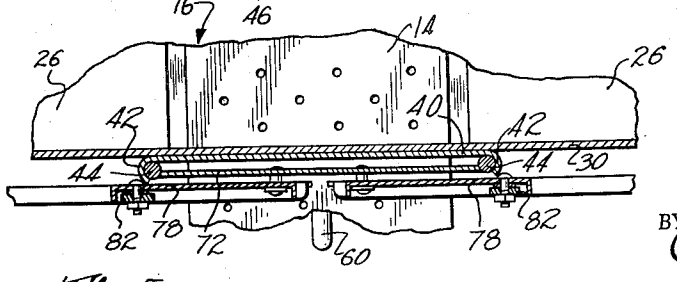


Fig. 5.

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APPARATUS FOR APPLYING JOINT CEMENT TO SEAM TAPE AND FEEDING THE LATTER IN FLAT OR FOLDED CONDITION

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10 Claims. (Cl. 118—32)

This invention relates to apparatus for placing joint cement on wall board seam tape and has for its primary object to provide novel mechanism for automatically applying dry wall joint cement to tape adapted for closing the joint between adjacent wall boards, and with the machine being adapted to feed the cemented tape in either flat or folded condition.

A specially prepared, perforated paper tape obtainable in rolls has long been used to cover the seams of abutting plaster or wall boards utilized in building construction, with joint cement initially being placed within the groove between abutting ends of the wall boards and then the tape being placed over the cemented seam and an additional coat of the adhesive applied over the top of the tape. After drying of the cement, the joint thereby formed is sanded until the same presents a relatively smooth surface whereby the walls may be papered or painted as desired after sizing of the same.

The above procedure has not been satisfactory because of the problem of forcing the joint cement into the groove between abutting ends of the wall boards and by utilization of a trowel or the like, particularly in corners of the room formed by the wall boards and in overhead situations wherein it is required to force the dry wall joint cement into a groove wherein such wet cement tends to gravitate therefrom.

It it, therefore, an additional important object of this invention to provide apparatus obviating the necessity of initially forcing dry wall joint cement into the crevice between abutting ends of wall boards or the like prior to placement of dry wall seam tape over the filled crack in order to present a relatively smooth joint.

An additional important aim of the invention is to provide apparatus for automatically depositing a predetermined amount of dry wall cement on the dry wall seam tape in a correct position, whereby the tape may be placed over the crevice between the adjacent wall boards in covering relationship thereto and presenting a firm, relatively smooth joint upon proper sizing and the like of the walls as well as the joints.

An equally important object of the invention is to provide apparatus of the character described which is adapted to apply dry wall joint cement to a predetermined length of seam tape with the tape either in a flat condition for application to corresponding flat surfaces, or in a longitudinally creased condition so that the tape having the cement thereon may be placed in a corner or the like.

A particularly important object of the invention is to provide apparatus for applying joint cement to seam tape and feeding the later in flat or folded condition by the simple expedient of shifting a control handle on the machine, whereby the tape emerges therefrom in either the flat or folded condition for immediate application to the wall.

Another important object is the provision of means on the apparatus for applying joint cement to seam tape adapted to permit adjustment of the amount of cement

which is applied to the tape, whether in a flat or folded condition as desired by the operator of the apparatus.

Other important objects of the invention will be described in greater detail or become obvious as the following specification progresses, such as the fact that the instant apparatus is relatively inexpensive, is not liable to frequent breakdown and produces the desired results with a minimum of moving parts and especially close tolerance assemblies.

In the drawings:

Figure 1 is a plan view of apparatus for applying joint cement to seam tape and feeding the latter in flat or folded condition, certain parts of the apparatus being broken away to reveal details of construction thereunder;

Fig. 2 is a vertical, cross-sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is an end elevational view of the instant apparatus with one of the movable plates thereof being broken away to show details of the gate construction therebeneath;

Fig. 4 is a fragmentary, end elevational view similar to Fig. 3 and showing the folding plates and gate structure in the normal positions thereof for creasing the tape longitudinally of the same;

Fig. 5 is an enlarged, fragmentary, horizontal cross-sectional view taken substantially on the line 5—5 of Fig. 3; and

Fig. 6 is a vertical, cross-sectional view on the line 6—6 of Fig. 2 and looking in the direction of the arrows.

Apparatus for applying joint cement to wall board seam tape is designated generally by the numeral 10 in the drawings and is shown in its preferred form. Apparatus 10 is adapted to apply cement to seam tape as the same is unwound from a roll 12 thereof and as an elongated length 14 of tape 16 is passed longitudinally through a trough section 18.

Trough section 18 includes a rectangular bottom portion 20 extending substantially the entire length of apparatus 10 but curved upwardly at 22 in a manner to substantially complementally conform with the normal configuration of roll 12. Opposed side wall portions 24 of trough section 18 are integral with corresponding longitudinal margins of bottom portion 20 and extend upwardly therefrom in perpendicular relationship to bottom portion 20 for a short distance, and then diverge outwardly as best shown in Fig. 6 to present the sloping slides 26 of a hopper broadly numerated 28 and directly overlying the major length of trough section 18. A substantially triangular, combination trough and hopper end wall 30 closes the end of hopper 28 opposed to curved portion 22 of bottom 20, while a second, substantially triangular end wall 32 is secured to the opposite sloping margins of sides 26 in spaced relationship to end wall 30 and intermediate the latter and curved portion 22 of bottom 20. It is to be noted that the lowermost, substantially horizontal edge 34 of end wall 30 terminates in vertically spaced relationship to the proximal part of bottom 20 and preferably adjacent the zone of merger of respective side wall portions 24 with sides 26. A guide 36 integral with the lower marginal portion of end wall 32 extends downwardly into trough section 18 between side wall portions 24 and terminates above the uppermost surface of bottom 20, as best shown in Fig. 2.

It can be seen in Figs. 1 and 2 that the segments of side wall portions 24 between end wall 32 and curved portion 22 of bottom 20 are of greater vertical height than the side portions 24 integral wtih sides 26 and thereby define a compartment for receiving roll 12. The outer margins of side wall portions 24 adjacent curved portion 22 of wall 20 are complemental therewith and suitably secured to curved portion 22 to eliminate sharp corners, and it is to be preferred that the distance between the outer face of end wall 32 and the

upper edge of curved portion 22 of wall 20 be substantially equal to the maximum diameter of a roll 12 of tape 16.

Inverted, substantially U-shaped legs 38 secured to the underface of trough section 18 in horizontally spaced relationship, maintain the latter in substantial parallelism with a supporting surface for apparatus 10.

A rectangular, horizontally U-shaped guide panel 40 is suitably secured to the outermost face of end wall 30 away from hopper 28 and includes a pair of opposed, parallel, upright, transversely arcuate, outwardly projecting sections 42 adapted to receive respective upright lengths 44 of a wire frame 46. Upper, substantially L-shaped stretches 47, integral with the upper extremities of lengths 44, project upwardly through an opening 48 in the horizontal flange 50 on the upper margin of end wall 30. Knob 52 over the upper ends of stretches 47 above flange 50 facilitate movement of frame 46 within arcuate guide sections 42 of panel 40. The lowermost horizontal stretch 54 of frame 46 and interconnecting the lower extremities of lengths 44 is normally positioned below bottom 20, regardless of the position of frame 46 along its path of travel within guide sections 42 of panel 40.

An elongated rod 56 is disposed with the major length thereof in overlying relationship to bottom 20 within trough section 18, with the end 58 of rod 56 secured to curved portion 22 of bottom 20 while the opposite extremity of rod 56 is integral with a longitudinally irregular component 60 and connected at the lower end thereof to stretch 54 of frame 46 in a manner to maintain the proximal extremity of rod 56 in spaced relationship to stretch 54. It should now be pointed out that when frame 46 is at the lowermost end of its path of travel within sections 42 of panel 40, the major length of rod 56 is in flat engagement with the uppermost face of bottom portion 20 and disposed intermediate side portions 24 as best illustrated in Fig. 2.

A forming element broadly numerated 62 is mounted within hopper 28 and cooperates with rod 56 in a way to be explained in detail hereafter. Bight 64 of element 62 directly overlies rod 56 and is sufficiently spaced from bottom portion 20 to cause the proximal length of rod 56 to be in relatively close relationship thereto when frame 46 is at the uppermost end of its path of travel, thereby shifting rod 56 upwardly in response to movement of component 60 with stretch 54 and rigidly interconnecting the latter with the adjacent extremity of rod 56. Substantially J-shaped legs 66 integral with bight 64 project downwardly therefrom and are integral with corresponding connecting legs 68 secured to the corresponding upwardly facing surfaces of sides 26, as shown in Fig. 6. The normally lowermost curved portions of legs 66 are disposed in sufficiently spaced relationship to the upper surface of bottom portion 20 to permit the length 14 of tape 16 to pass thereunder.

Gate structure broadly numerated 70 is connected to frame 46 and includes a rectangular gate 72 secured at opposed upright, longitudinally extending edges thereof to lengths 44 intermediate stretch 54 and L-shaped stretches 47. When frame 46 is at the lowermost end of its path of travel as shown in Fig. 3, the lowermost margin 74 of gate 72 is spaced slightly above the proximal extremity of bottom portion 20 and sufficient to permit the length 14 of tape 16 to be drawn outwardly from trough section 18 through the open end thereof defined by bottom 20 and side walls 24. It is to be preferred that the lower margin 74 of gate 72 have an upwardly extending, arcuate slot 76 therein medianly disposed between stretches 44 and thereby side portions 24 for permitting a greater amount of cement to be deposited on length 14 of tape 16 at the central, longitudinally extending portion thereof.

A pair of polygonal plates 78 are pivotally connected to gate 72 by a pair of opposed, horizontally aligned pivot assemblies 80, while elongated links 82 additionally pivotally interconnect respective plates 78 with end wall 30. A bolt and wing nut unit 84 extending through end wall 30 and with the wing nut overlying the upright portions of stretches 47, permits releasable connection of frame 46 to end wall 30 when desired.

When frame 46 is at the lowermost end of its path of travel, the opposed tape-engaging edges 86 of plates 78 are maintained in sufficiently spaced relationship to clear opposed, longitudinal margins of tape 16 as the same is pulled outwardly from trough section 18, but when frame 46 is forced upwardly to the upper end of its path of travel as shown in Fig. 4, plates 78 are shifted to locations with edges 86 thereof spaced a distance substantially less than the normal width of tape 16 whereby the same is creased longitudinally thereof.

In operation, and assuming that it is desired to apply dry wall joint cement or the like to the length 14 of perforated dry wall seam tape 16, roll 12 is placed within the receptacle defined by side wall portions 24 and curved portion 22 of bottom 20 and the length 14 of tape 16 threaded under guide 36 and thence outwardly through the opening presented by the lower margin 74 of gate 72 and bottom 20, as well as side portions 24. The length 14 of tape roll 12 overlies rod 56 and passes beneath the arcuate segments of legs 66.

Next, a supply of moist dry wall joint cement is introduced into hopper 28, whereby length 14 of tape 16 is subjected to such cement as the tape is pulled through trough section 18. Assuming that a flat length of tape having cement applied thereto is desired to be pulled from apparatus 10, frame 46 is shifted to a position as shown in Fig. 3 with the lower margin 74 of gate 72 in proximity to bottom portion 20 of trough section 18 and with plates 78 swung toward the outermost ends of their paths of travel and in positions with the edges 86 thereof clearing opposed, longitudinally extending margins of tape 16. The amount of dry wall joint cement deposited on length 14 of tape 16 is dependent upon the spacing of margin 74 of gate 72 from bottom portion 20, although it can be recognized that slot 76 in the lower margin 74 of gate 72 permits a larger amount of material to remain on tape 16 along a line disposed centrally of the longitudinal length of tape 16.

Shifting of frame 46 upwardly to a slight extent permits variation of the amount of material deposited on tape 16 and bolt and wing nut unit 84 adjustably secures gate 72 in any predetermined position for the desired amount of cement which should remain on the tape for the particular wall seam sealing operation.

The length of tape 16 having the dry wall joint cement applied thereto is in condition for immediate placement in covering relationship to the seam between opposed wall boards, and it is to be understood that the raised area of cement along the central portion of the tape is adapted to be received within the crevice between the adjacent margins of the plaster boards. Thus, introduction of cement into the crevice between the boards prior to placement of the tape thereon is precluded and a more uniform wall appearance is obtained and in a shorter period of time.

When it is required to tape a corner presented by a pair of wall boards in substantially perpendicular relationship, tape having cement applied thereto and in a folded condition may be pulled from apparatus 10 by simply grasping knob 52 and shifting frame 46 to the uppermost end of its path of travel after release of bolt and wing nut unit 84, whereby gate 72 and rod 56 move upwardly with frame 46 and plates 78 are swung about respective pivot assemblies 80 to positions as shown in Fig. 4 with edges 86 thereof in relatively close relationship. Rod 56 which has been shifted into proximity to bight 64 cooperates with the latter and adjacent portions of legs 66 to crease length 14 of tape 16 longitudinally thereof, and edges 86 of plates 78 further

increase the folding effect by virtue of opposed, longitudinal margins of tape **16** engaging corresponding edges **86**. The lower margin **74** of gate **72** is still disposed above the upper face of tape **16** and therefore, a ridge of dry wall joint adhesive is permitted to remain on the apex of the folded tape.

It is to be noted that the tape **16** normally employed for covering wall board seams has a line of scoring or similar indentation disposed centrally of the same and extending longitudinally thereof, and which operates to facilitate creasing of length **14** of tape **16** within apparatus **10**.

Since tape **16** is pulled from the outlet of apparatus **10** by hand, any length of cemented tape may be formed and cut to size by utilization of a suitable shearing instrument.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In apparatus for applying joint cement to wall board seam tape comprising an elongated trough having an inlet end and an outlet end and through which the tape is adapted to be passed from the inlet to the outlet thereof; a hopper communicating with the trough and adapted to receive a supply of the material; shiftable means at one end of the trough for metering the amount of material deposited on the tape from the hopper as the same is pulled outwardly therefrom through said outlet end; and structure at said outlet end of the trough engageable with said tape responsive to said shiftable means for creasing said tape longitudinally thereof as the same is passed through the trough and pulled outwardly through said outlet end.

2. In apparatus for applying joint cement to wall board seam tape comprising an elongated trough having an inlet end and an outlet end and through which the tape is adapted to be passed from the inlet to the outlet thereof; a hopper communicating with the trough and adapted to receive a supply of the material; means at said inlet end of the trough for receiving a roll of said tape and disposed to permit one end of the tape to be fed into said inlet end of the trough whereby the roll unwinds as the tape is continuously fed through the trough toward said outlet thereof; shiftable means at one end of the trough for metering the amount of material deposited on the tape from the hopper as the same is pulled outwardly therefrom through said outlet end; and structure at said outlet end of the trough engageable with said tape responsive to said shiftable means for creasing said tape longitudinally thereof as the same is passed through the trough and pulled outwardly through said outlet end.

3. In apparatus for applying joint cement to wall board seam tape comprising an elongated trough having an inlet end and an outlet end and through which the tape is adapted to be passed from the inlet to the outlet thereof; a hopper communicating with the trough and adapted to receive a supply of the material; a gate shiftably mounted on the trough in normally substantially closing relationship and movable vertically from a position permitting the tape to pass between one extremity thereof and the lower portion of the trough to thereby meter the amount of material deposited on the tape from the hopper as the same is pulled outwardly therefrom through said outlet end, to a location permitting the tape to pass outwardly from the outlet end of the trough in a longitudinally creased condition; and structure at said outlet end of the trough engageable with said tape responsive to said gate for creasing said tape longitudinally thereof as the same is passed through the trough and pulled outwardly through said outlet end and only when said gate is out of said position thereof.

4. Apparatus as set forth in claim 3 wherein said structure includes a pair of plates pivotally joined to the gate and movable to positions engaging opposed longitudinal edges of the tape in response to shifting of the gate from said position thereof toward said location of the same, the distance between the portions of the plates engaging the tape when the gate is out of said position thereof being less than the normal width of the tape whereby the latter is at least partially creased longitudinally thereof by said plates as the same is pulled outwardly from the outlet end of said trough.

5. Apparatus as set forth in claim 4 wherein said structure includes a member shiftable with said gate and engageable with the normally underside of the tape intermediate the longitudinal edges thereof and when the gate is out of said position thereof for cooperating with said plates in creasing the tape longitudinally of the same.

6. Apparatus as set forth in claim 5 wherein said member comprises an elongated rod having a major length thereof extending longitudinally of the trough and pivotally joined to the latter at the extremity thereof remote from said outlet, the opposite extremity of the rod being rigidly secured to the gate, maintained in sufficiently spaced relationship to the normally lower edge thereof to clear the tape and a predetermined amount of material deposited thereon, and movable with said gate.

7. Apparatus as set forth in claim 6 wherein the lower edge of the gate is provided with an upwardly extending slot therein intermediate the upright extremities of the gate and aligned with the longitudinally central part of the trough to permit a greater amount of material to remain on the longitudinally central part of the tape as the same is pulled outwardly from the outlet end of said trough.

8. Apparatus as set forth in claim 6 wherein the means rigidly securing said opposite extremity of the rod to the gate includes a U-shaped bracket carried by the gate and depending therefrom and a rigid component connected to the lower stretch of the bracket and said opposite extremity of the rod respectively.

9. Apparatus as set forth in claim 8 wherein is provided a U-shaped forming element secured to the trough therewithin and in an upright position adjacent said outlet end of the trough, said element having a bight remote from the lowermost portion of the trough and a pair of opposed legs connected to said bight and disposed to receive said major length of the rod therebetween as the gate is shifted toward said location thereof, there being means securing the lower extremities of said legs to the trough in positions clearing the tape passing through said trough in overlying relationship to said major length of the rod.

10. Apparatus as set forth in claim 6 wherein is provided link means pivotally interconnecting said trough and each of the plates disposed to cause the lower ends of said plates overlying said outlet of the trough to be moved toward and away from each other as the gate is shifted vertically.

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