United States Patent [19]

Moree

[11] **3,880,701**

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[54] **APPARATUS FOR APPLYING TAPE**

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[73] Assignee: **Colwest Corporation**, Wheat Ridge, Colo.

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[52] **U.S. Cl.** **156/526**; 156/575; 156/577; 156/579

[51] **Int. Cl.** **B44c 7/02**

[58] **Field of Search** 156/524, 577, 545, 509, 156/505, 506, 526, 575, 579; 221/70

[56] **References Cited**

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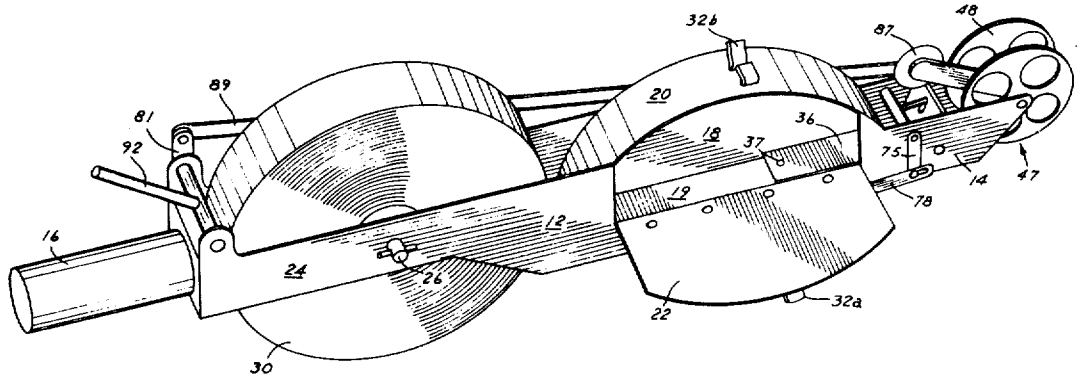
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Assistant Examiner—M. G. Wityshyn
Attorney, Agent, or Firm—Richard D. Law

[57] **ABSTRACT**

An elongated frame includes a tape roll mounting means, a mastic mud reservoir through which the tape passes, wiper means, and application rollers for pressing the tape into place. Tape holding mechanism and tape cutting means are individually actuated by a slide actuator.

3 Claims, 8 Drawing Figures



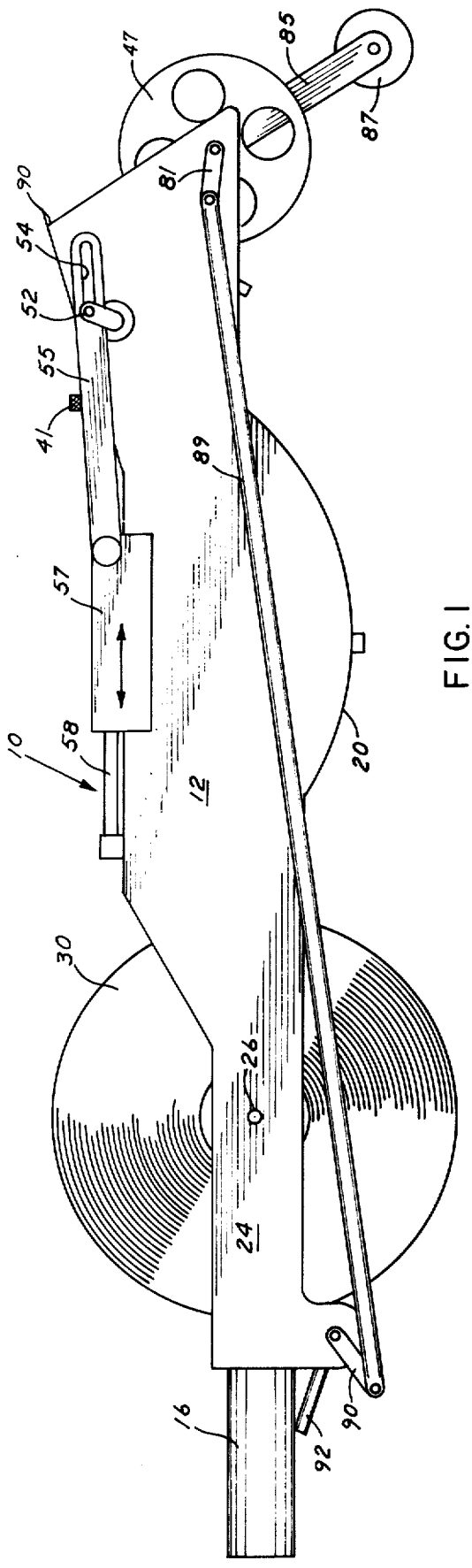

47
85
87
81
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89
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12
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30
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24
16
92
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FIG. 1

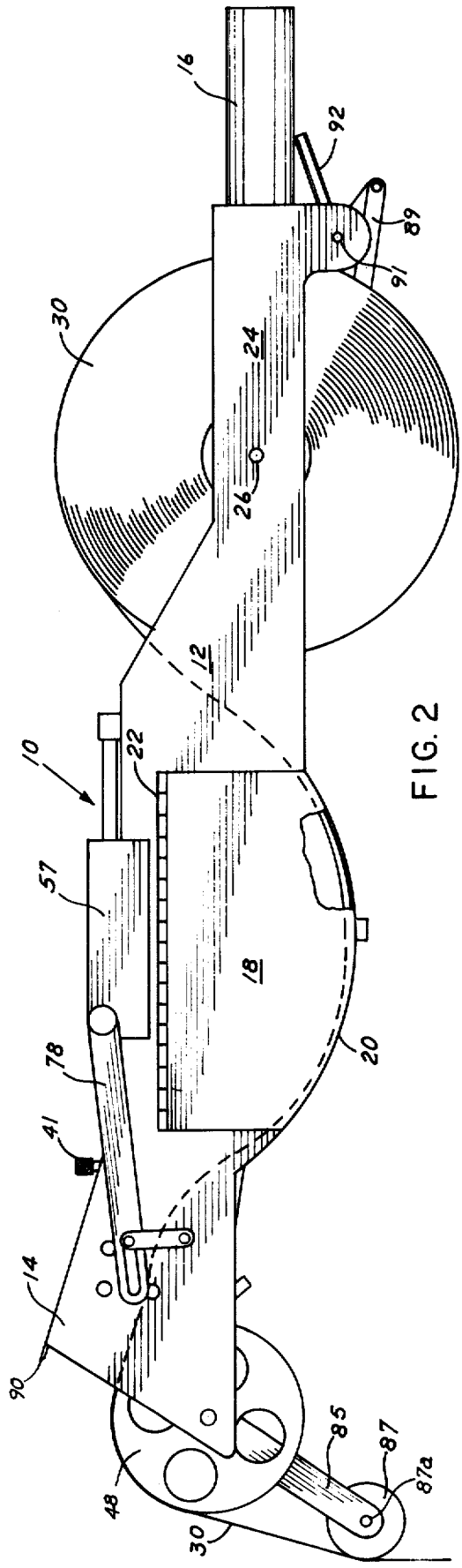

16
92
89
91
30
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22
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18
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78
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14
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48
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87a
30

FIG. 2

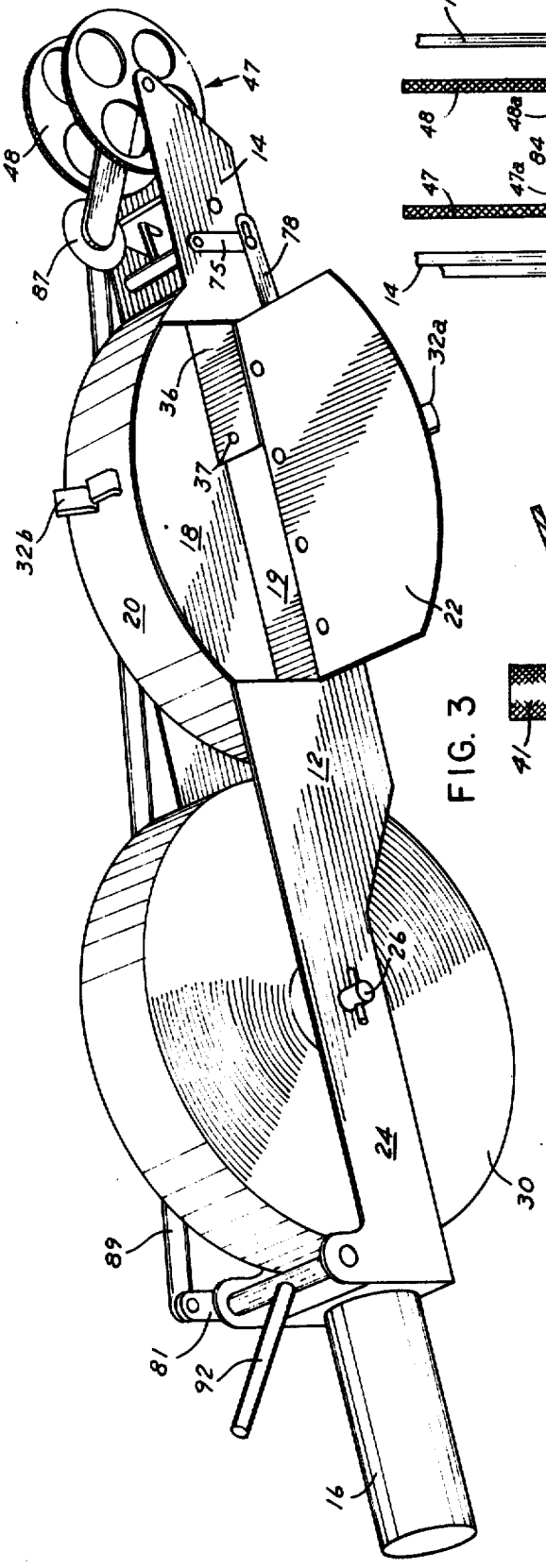


FIG. 3

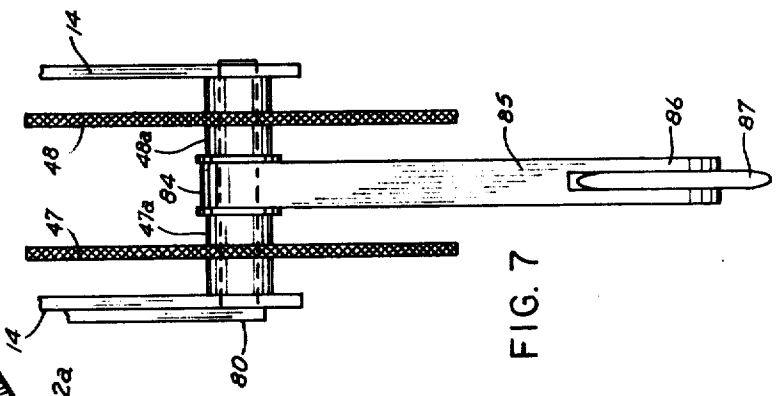


FIG. 7

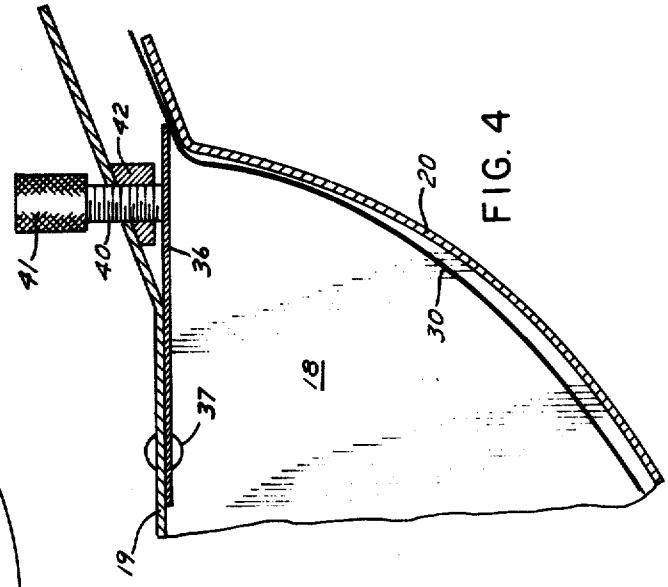


FIG. 4

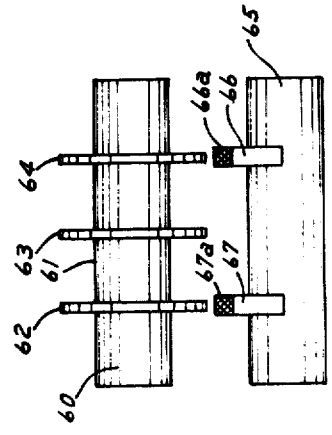


FIG. 8

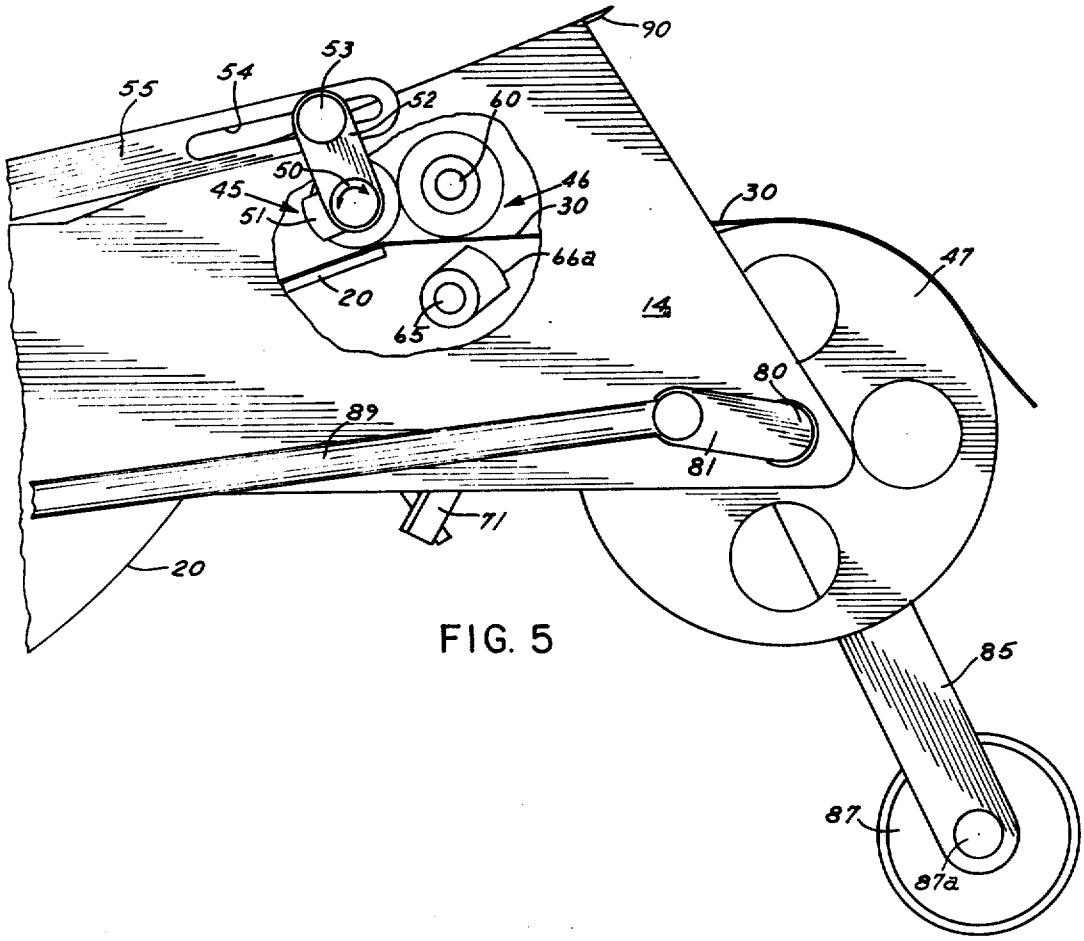

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60
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66a
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80
89
81
71
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85
87
87a

FIG. 5

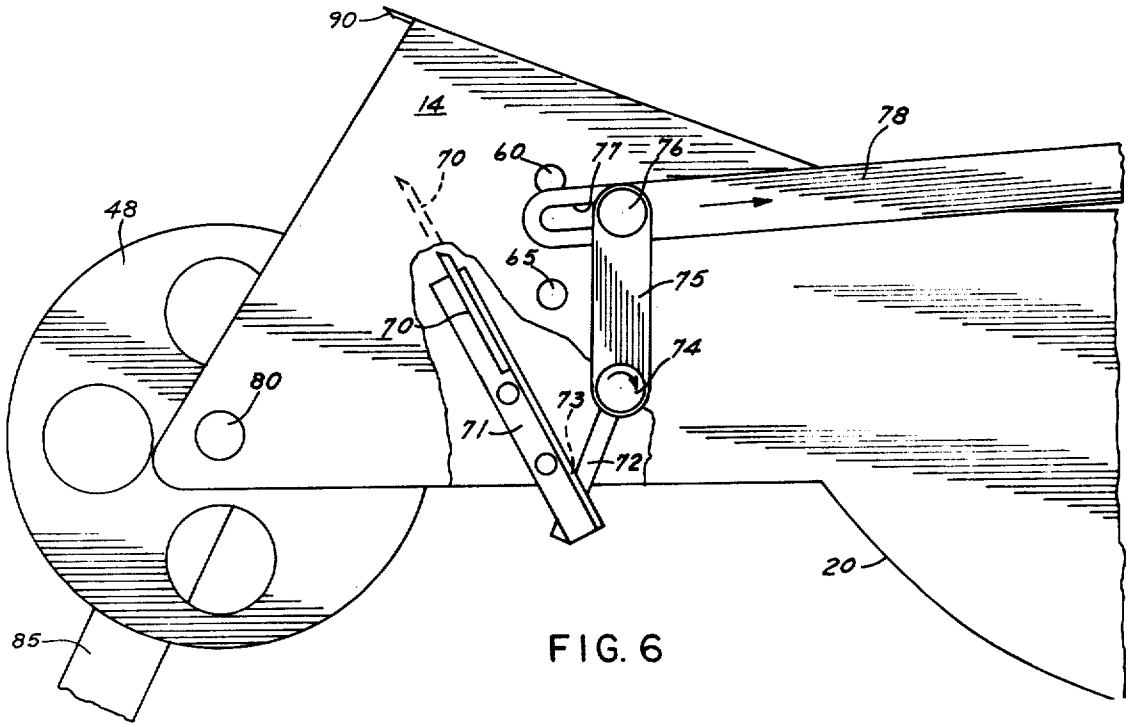

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72
20
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FIG. 6

APPARATUS FOR APPLYING TAPE

This invention relates to improvements in taping machines for wallboard, gypsum board, sheet rock, dry wall, or the like, and is arranged to supply adhesive coated tape over the joints of the wallboard or the like.

The joints between abutting panels of various types of wall covering sheet material is conventionally covered with a paper tape. Such tape is coated with an adhesive, usually a plaster or spackling material and either of these serves as an adhesive for securing the tape to the joints. Additional adhesive material may subsequently be added to provide sufficient material to present a smooth surface over the joint.

Apparatus for applying tape to wall boards on a production basis are well known in the art. However, the known taping machines are rather elaborate affairs, being very expensive to manufacture and mostly are rented to the user, rather than a direct sale. One available mechanical taping machine includes a tape holder which applies the tape to the wall and a separate reservoir and pump which pumps mud through a hose to the applicator. Such an apparatus, and other commercially available units, is useful for large contractors, but is not economically feasible for smaller contractors where taping constitutes a rather small portion of their total business. Other disadvantages of current taping machines include cleaning problems, which prevent a thorough daily cleaning of the unit, difficult feeding of adhesive mud to the mud reservoir, excessive weight of the unit, etc.

It is, therefore, among the objects and advantages of the present invention to provide a taping machine for paper tape which is simple to use and is sufficiently light weight for continuous use during a full work day.

Another object of the present invention is to provide a taping machine of simple design which is easily cleaned of mud, adhesive or the like.

Another object of the invention is to provide a reservoir for adhesive which is arranged to maintain adhesive in contact with tape passing through the reservoir.

Yet another object of the invention is to provide a taping machine having an accurate control on the quantity of adhesive applied to the tape.

A still further object of the invention is to provide a taping machine having a single lever control for a cutting mechanism and a tape holding mechanism.

An additional object of the invention is to provide a taping machine which is easily handled by a single workman and is easily manipulated throughout a taping operation.

These and other objects and advantages of the invention may be readily ascertained by referring to the following description and appended illustrations in which:

FIG. 1 is a side elevational view of the right side of a tape machine according to the invention;

FIG. 2 is a side elevational view of the left side of the taping machine according to the invention;

FIG. 3 is a perspective view of a taping machine according to the invention with reservoir open for filling with an adhesive;

FIG. 4 is an enlarged detail, cross-sectional view of an adhesive gate valve of the taping machine according to the invention;

FIG. 5 is an enlarged detail view, partly broken away, of a tape holding mechanism;

FIG. 6 is an enlarged detail view, partly broken away, of a tape cutting mechanism according to the invention;

FIG. 7 is a front elevational view of tape applying wheels of the tape machine of the invention; and

FIG. 8 is a front elevational detail of the loading mechanism and reversed holding mechanism of the cam according to the invention.

In the form of a tape applying apparatus selected for illustration, a taping unit, shown in general by numeral **10**, includes an elongated body **12** terminating in a bifurcated end **14** at one end and a manipulating handle mechanism **16** at the opposite end. Included on the frame **12** is a mud reservoir **18** having an arcuate wall **20** and a cover **22**. The mud reservoir is mounted intermediate the ends of the device, providing a slit entrance for tape and a slit exit for tape. Adjacent to the mud reservoir is a bifurcated section **24** having a shaft **26** extending through both sides of the bifurcated section holding a roll of paper tape **30**. The free end of the tape **30** passes into the reservoir **18**, normally conforming along the arcuate wall **20**, and out through bifurcated end **14** for application to the wall, as explained below. The hinged cover **22** is provided with a latch mechanism closing the reservoir, and a luggage type lock **32***a* and **32***b* is satisfactory. Various latch mechanisms may be used.

A gate valve mechanism is arranged in the reservoir at the outlet end for the tape passing through the reservoir, and it includes gate valve **36** (FIGS. **3** and **4**) secured by fastening means **37** to the upper wall **19** of the reservoir **18** and extending over the outlet to the reservoir. A bolt or screw **40** having a knurled head **41** for mainpulation is threaded through wall **19** having a threaded reinforcing member **42** thereon. The bolt variably bears against the gate valve **36**. This provides an adjustment of the distance between the gate valve **36** and the wall **20** as the tape **30** passes through the reservoir **18** and over the outlet past the gate valve. Therefore, the quantity of adhesive on the tape may be controlled.

The tape leaving the reservoir passes under a tape locking mechanism, shown in general by numeral **45**, FIG. **5**, between a reverse locking set shown in general by numeral **46** and over applicator rolls **47** and **48**. The locking mechanism includes a shaft **50** having an attached eccentric **51** arranged to press the tape **30** against the wall **20** when the shaft **50** is rotated in a counterclockwise rotation. An arm **52** is secured to the shaft **50**, and the arm **52** is pinned by a pin **53** into a slot **54** in a push-pull rod **55**. The rod **55** is pivotally mounted on a slide bar **57** (FIG. **1**) which is arranged to slide on track **58**. A tape locking cam **51** mounted on shaft **50** is arranged to lock the tape between it and wall **20** before movement of the cutting knife in cutting the tape.

When the slide **57** is moved to a full forward position the arm or crank **52** is pushed forwardly in a clockwise rotation around the shaft **50** raising the cam **51** from the wall **20** and releasing the tape **30** for freely passing therebetween. When the arm is moved backwardly to release the pressure from the back of the slot on the pin, the spring rotates the shaft counterclockwise so that the eccentric **51** bears against the wall **20** and the tape therebetween. The elongated slot gives a lost motion to the connecting arm **55** and permits it to release only when the slide **57** is moved to the full forward po-

sition. In intermediate positions the tape is locked between the eccentric **51** and the wall **20.**

To prevent the tape from backing up into the unit, a one-way gate is provided, as shown in FIGS. **5** and **8.** A shaft **60** mounted between the two walls of the bifurcated end is arranged with a free running roller **61** having three discs **62, 63** and **64,** thereon. The roller **60** is arranged for free rotation in a counterclockwise direction. A second shaft **65** (mounted below shaft **60**) is provided with a pair of spaced apart eccentrics **66** and **67** which are secured to and rotate with the shaft **65.** The edge **66**a of eccentric **66** is smooth and the edge **67**a of the eccentric **67** is likewise smooth. The shaft **65** is spring loaded by means of a helical spring, not shown, biasing it in a counterclockwise direction, so that the tape **30** between the roller discs and the eccentrics may freely pass outwardly. On reverse movement of the tape **30,** the eccentrics press against the discs locking the tape from a reverse motion. This arrangement provides means for preventing reverse rolling of the tape roll **30.**

The tape cutter, FIG. **6,** includes a sliding knife **70** mounted in a slide guide **71** which is mounted between walls of the bifurcated end **14.** The knife is arranged to move from a retracted position, shown in full lines **70,** to an extended position, shown in dash lines. Movement of the knife is achieved by means of an arm **72** mounted in a slot **73** in the knife. The arm **72** is affixed to a shaft **74** and pivots therewith. The shaft has a lever arm **75** attached thereto so that movement of the arm **75** rotates the shaft **74** moving the arm **72** upwardly and downwardly and extending or retracting the knife blade **70.** The arm **75** is pinned by means of a pin **76** into a slot **77** in push-pull arm **78** which is attached to the slide **57.** The slot provides a lost motion for the arm **78** whereby the slide may be moved forward, to release the lock of the cam **51** on the paper as explained above without pressing the arm **72** against the bottom of the slot **73** of the knife.

At the outer end of the end **14** is mounted a shaft **80** between the two walls. Attached to the shaft at one end, on the outside of the wall, is an arm **81** arranged for rotational movement therewith. Mounted on the shaft **80** are the two freely rotating wheels **47** and **48** each having hubs **47**a and **48**a for spacers and a serrated edge. The wheels are arranged to press the adhesive coated tape onto wall board. Secured to the shaft for rotation therewith between the two wheels, is a hub **84** from which extends an arm **85.** A bifurcated end **86** in arm **85** supports a rotatable wheel **87.** The wheel **87,** mounted on shaft **87***a* between the ends of bifurcated end **86,** is arranged to be moved into forward position to crease the tape coming over wheel **47 – 48,** permitting it to be moved into a corner which is being taped. Pivotally attached to the bell crank or arm **81** is push-pull rod **89** which is attached at its opposite end to a bell crank **90** secured to a shaft **91** (FIG. **2**) mounted for rotation below the handle **16.** Secured to the shaft **91** and arranged for rotation therewith is a manipulating handle **92.** The lever system is arranged so that when the handle **92** is pivoted away from the handle **16** the creasing roller **97** is moved into a retract position. When the handle **92** is pulled into general contact with the handle **16,** shown in FIG. **1,** the roller **87** is extended. This permits the worker to use one hand to operate the creaser roller when desired. The roller is moved to extended position as shown in FIG. **1.** In this extended position the creaser creases the paper tape as it is moved onto the wall from the unit. A stationary knife **90** mounted above the wheels **47 – 48** between the walls of end **14** provides means for cutting tape apart from the blade **70.**

For use of the unit, a roll of tape **30** is placed on the shaft **26** and the end of the tape is passed through the opening into the reservoir **18** and out between gate valve **36** and wall **20.** The slide **57** is pushed fully forward so that tape may move freely between locks **45** and **46.** The tape is pulled through the one way gate **46** and passed over the rollers **47.** The tape is moved to generally conform to the wall **20** and the reservoir **18** is filled with the adhesive. The cover for the reservoir is closed and locked and the machine is then ready for use. A sufficient amount of tape is pulled out through the unit so that tape coated with adhesive appears on the rollers. Note that the inside of the tape is coated with the adhesive and as it extends out over the rollers that is the side of the tape which contacts the wall. Thus the adhesive is on the tape side contacting the wall. The gate valve is adjusted for desired thickness of adhesive by rotating the thumb screw **41.** The unit is then ready for use. Tape with adhesive on the exposed surface is passed over the rollers **47** and **48** and placed on the wall at the bottom of a joint. The slide **57** is pushed full forward to release the lock on the tape, so that the taping may proceed. The unit is then moved upwardly while the wheels are in contact with the wall. The unit is moved up the wall along the joint to the ceiling. At the wall-ceiling intersection, the slide **57** is pulled to the full reverse position, which locks the paper tape and extends the knife forwardly cutting the tape at the joint. The slide is moved full forward. Additional tape is then pulled out around the wheels **47** and **48** and the taping of a ceiling proceeds by forcing the tape against the ceiling with the wheels **47 – 48.** The machine is moved across the joint on the ceiling to the other intersection of the ceiling with the wall. At this point the slide is again pulled to full reverse, cutting the tape. After which, the slide is moved to full forward position again releasing the tape for continued taping.

The action of the unit maintains a constant pressure of the tape against the supply of adhesive in the reservoir. This is completely across the width of the tape and for the length of the reservoir. This insures that the width of the tape is completely covered with the adhesive. As the quantity of adhesive reduces in the reservoir, the tape moves with it away from the wall **20** so as to maintain full contact between the adhesive and the tape for sufficiently coating the tape. This insures that it will adhere to the wall. As the quantity of adhesive reduces, the tape approaches the top wall **19** of the reservoir.

When an inside corner to be taped is encountered, the operator merely pulls a handle **92** against the main handle **16** extending the creasing roller **87.** Tape is then passed over the rollers **47** and **48** which are moved into contact with the walls straddling the corner. In this position, the creasing roller **87** is in the corner and it creases the tape as it is applied to the wall. The creasing roller stretches the tape between the two rollers, and all three rollers jointly lay the tape on the wall tightly and neatly creased. When the intersection of ceiling and wall is met, the slide is pulled back moving the cutter into cutting position and cutting off the tape at the corner, as explained above.

By making the unit about 34 inches long, the average height worker is able to tape the walls and the ceiling without additional help from elevating devices such as saw horses, stilts or the like, and he may produce a good taping job with a minimum of work in the taping process. By adjusting the gate valve the correct amount of adhesive may be applied to the tape so that the tape will provide a smooth joint when applied to the wall. Further, no extraneous adhesive leaves the reservoir so that there is no dripping of adhesive on the floors of the building, and the clean-up after taping is minimal. As no extraneous adhesive leaves the unit during the taping, there is essentially no clean-up of the tape after it is applied to the wall. Additional adhesive may be applied to the tape after the cement in the adhesive has dried, by the usual adhesive trowel.

I claim:

1. A taping device for spreading an adhesive on one side of a continuous strip of tape and applying the tape to wall board or the like, the taping device comprising:

elongated frame means including an enclosed elongated reservoir for adhesive having a tape inlet and a tape outlet arranged at opposite ends of said resorvoir;

said reservoir having one straight wall and an opposed arcuate wall against which tape is placed prior to filling said reservoir with adhesive, said arcuate wall being arranged to extend continuously between said inlet and said outlet so as to concentrate the adhesive placed in the reservoir and said tape is in continuous contact with the adhesive in the reservoir, whereby the tape passing through the reservoir is completely coated by the adhesive;

support means for a roll tape mounted on said frame means adjacent to and in alignment with said reservoir whereby tape leaving said roll passes directly into said reservoir;

manipulating handle means extending outwardly from said support means;

adjustable gate valve means mounted at said tape outlet arranged to press against said arcuate wall with the tape passing therethrough having its uncoated side against said arcuate wall and to control the amount of adhesive on the opposite side of the tape;

one way release means adjacent the outlet of said reservoir for passing tape outwardly from said gate valve means to prevent inward movement thereof;

selectively operable lock means for temporarily locking said tape from travel from said gate valve means;

cut-off knife means movable to tape cutting position;

operating means adjacent said reservoir interconnecting said releasable lock means and said cut-off knife and arranged to initially actuate said selectively operable lock means and thereafter actuate said cut-off knife means; and

a pair of independent, freely rotatable tape applicator wheels mounted on the end of said frame means spaced from and independent of said cut-off knife means positioned to pass the adhesive coated side of tape to a wall and press the coated tape against the wall.

2. A taping device according to claim 1 wherein said one way release means includes a cam and a roller having the tape pass therebetween and having said cam biased toward said roller providing one-way movement of the tape.

3. A taping machine according to claim 1 wherein said selectively operable lock means and said cut-off knife means are actuated by push-pull rods with lost motion connections therebetween, said rods being connected to a common slide, said lost motion connections being operable through different ranges of movement of said slide whereby said lock means may be actuated prior to actuating said cut-off knife means.

* * * * *