

May 10, 1955

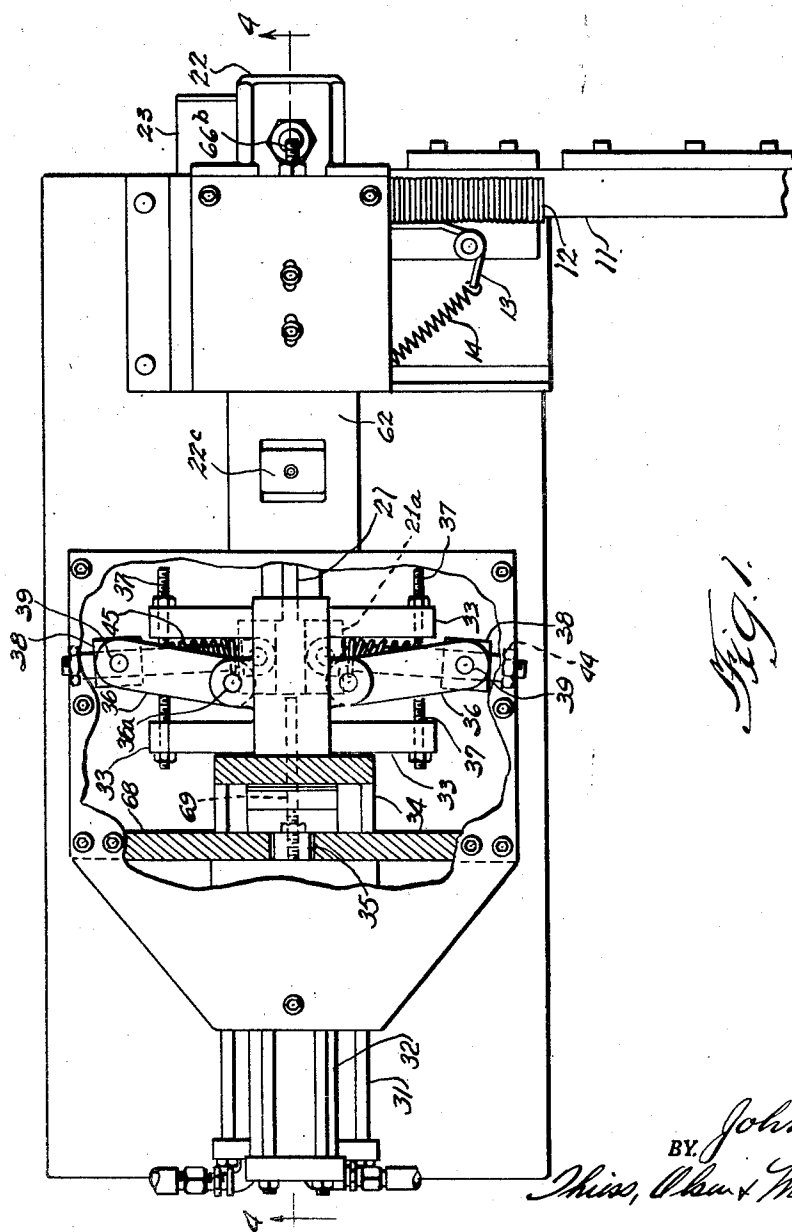
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2,707,818

BUNDLE CLIPPING MACHINE

Filed May 13, 1949

6 Sheets-Sheet 1



INVENTOR.

BY *John Page*

Miss, Olin & Mecklenburg
Pitts.

May 10, 1955

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BUNDLE CLIPPING MACHINE

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6 Sheets-Sheet 2

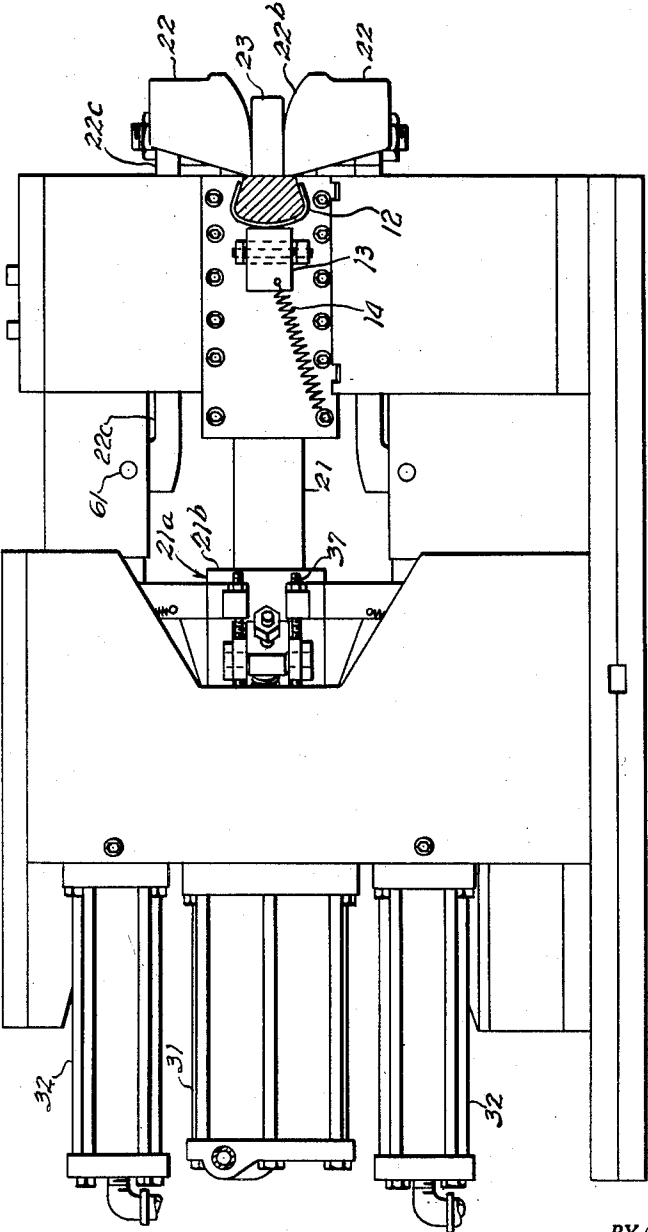


Fig. 2.

INVENTOR.
John Page.
BY *Thos. A. Mucklenberg*
Cattys

May 10, 1955

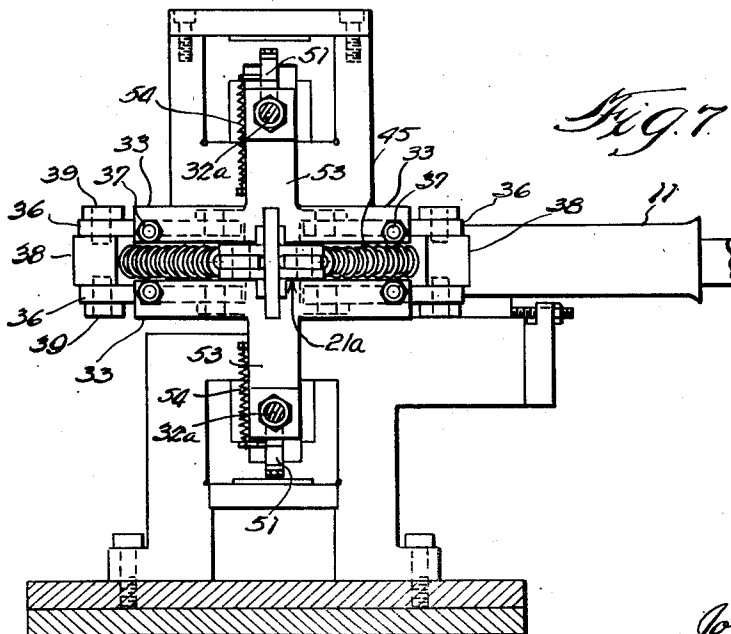
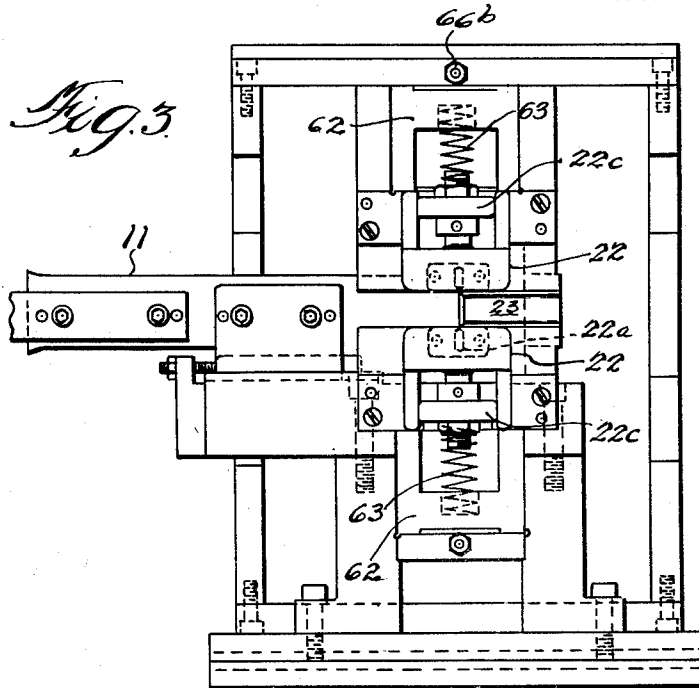
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BUNDLE CLIPPING MACHINE

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6 Sheets-Sheet 3



INVENTOR.

BY.

John Page
Thos. Chas. Muehlenburger
Attys

May 10, 1955

J. PAGE

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BUNDLE CLIPPING MACHINE

Filed May 13, 1949

6 Sheets-Sheet 4

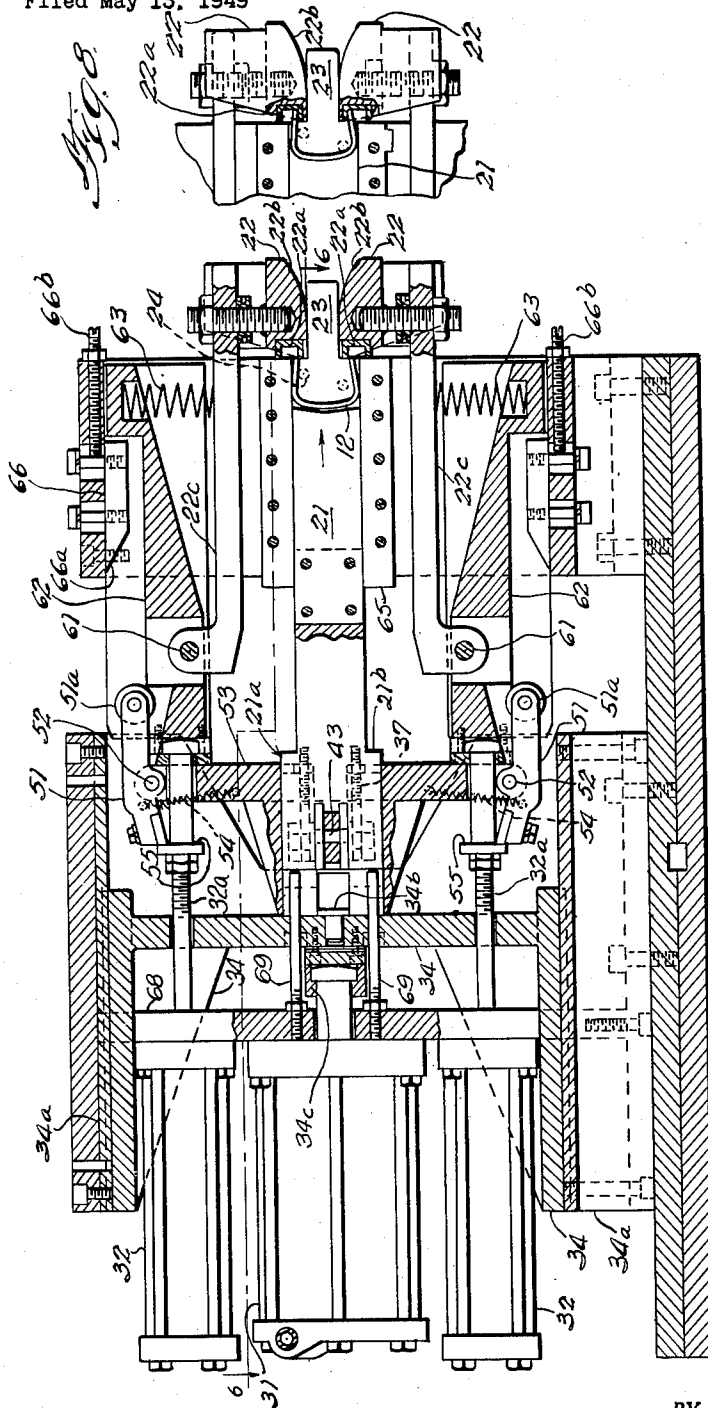


Fig. 4.

INVENTOR.

BY *John Page*
Thos. Chan & Mark Lee *Attys.*

May 10, 1955

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BUNDLE CLIPPING MACHINE.

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6 Sheets-Sheet 5

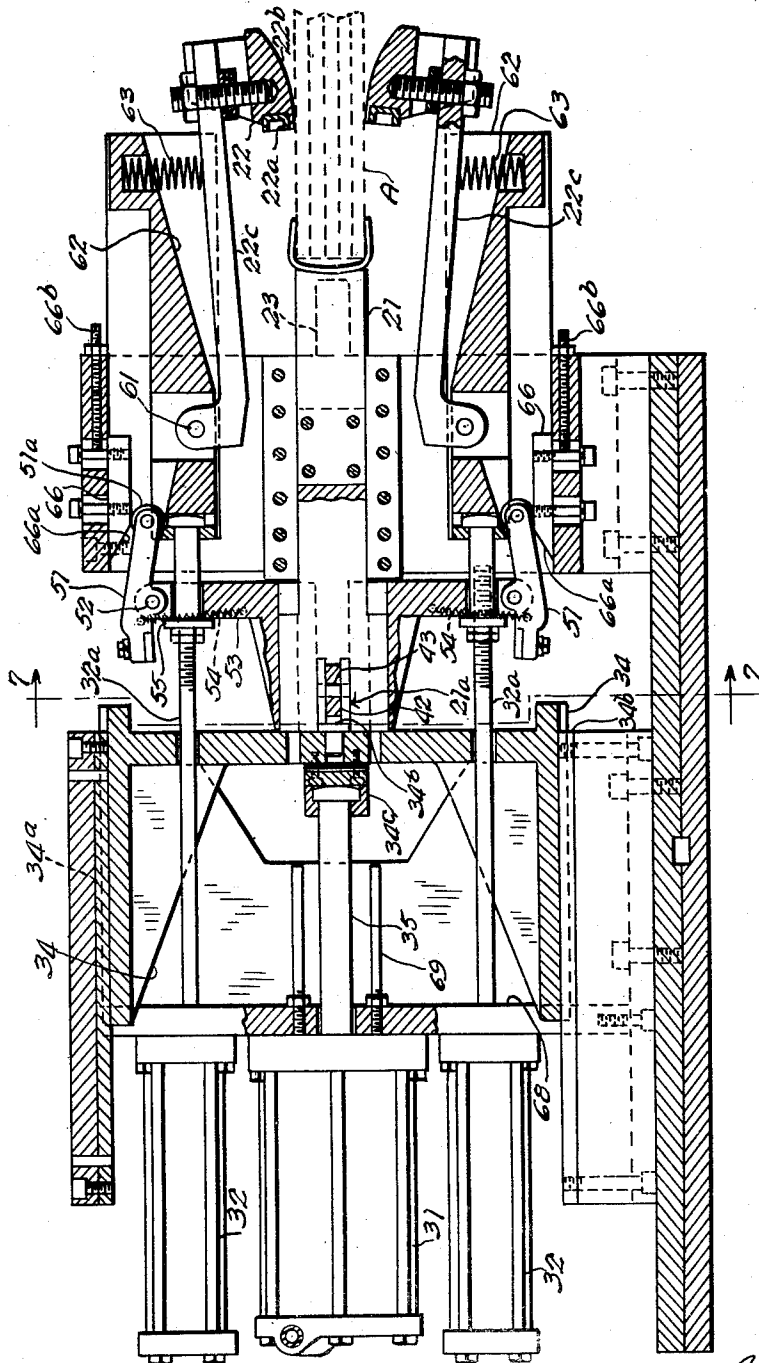


Fig. 5.

INVENTOR.

BY *John Page*

Thos. Chas. & Mack Co. Inc.

Attys.

May 10, 1955

J. PAGE

2,707,818

BUNDLE CLIPPING MACHINE

Filed May 13, 1949

6 Sheets-Sheet 6

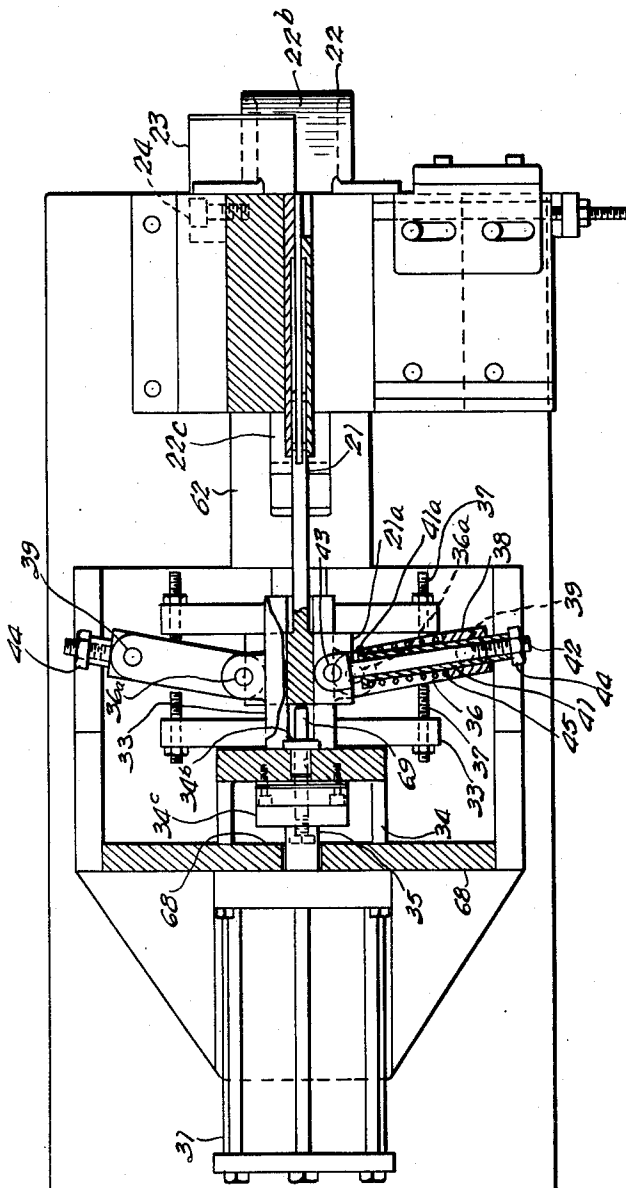


Fig. 6.

INVENTOR.

BY

John Page.
Thies, Olson & Mackenburger
Attys.

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2,707,818

BUNDLE CLIPPING MACHINE

John Page, Evanston, Ill., assignor to United States Gypsum Company, Chicago, Ill., a corporation of Illinois

Application May 13, 1949, Serial No. 93,106

11 Claims. (Cl. 29—208)

This invention relates to a machine for applying fasteners to bundles or packages, and it is an object of this invention to provide an improved machine of that character.

More particularly, the invention relates to a machine for spreading a U-shaped spring clip and driving the clip, in its spread position, over a bundle so that the clip is left in a gripping position with respect to the bundle, the ends of the clip engaging opposed faces of the bundle.

The specific application of the invention which will be described herein concerns the application of such spring clips to a bundle of sheets of plasterboard. At the present time, it is common practice to bind four or more sheets of plasterboard into a bundle by the use of gummed paper tape. This is a relatively expensive operation and the removal of the tape is inconvenient and burdensome. It is believed that the use of spring clips for holding such bundles of plasterboard together is an improvement over the use of gummed paper tape in that it is more economical of material and labor and that the clip may be much more conveniently removed than gummed tape.

The principal functions of any machine for applying spring clips to bundles are spreading the ends of the spring clips, driving the clips over the edges of the bundle and releasing the ends of the clip so that they grip two opposed faces of the bundle.

The embodiment of this invention described herein for accomplishing these purposes includes a sliding element for engaging the base of the U-shaped spring clip and driving the clip forwardly into clamping position with respect to the bundle. A pair of jaws is provided having recesses in their rearward faces for receiving the ends of the spring clip. Means are provided to move the sliding element forwardly a short distance with respect to the jaws before the jaws start their forward stroke in order to accomplish the insertion of the clip ends into the recesses in the jaws.

The jaws then move in conjunction with the driving element as the spring clip approaches and engages the bundle, the jaws moving apart as they slide over the edge of the bundle and, at the same time, spreading the ends of the clip in order that the clip may engage the bundle. When the clip has reached its proper position with respect to the bundle the sliding element stops but the jaws continue their forward movement and release the ends of the clip whereby the clip engages opposed faces of the bundle and securely holds together the various sheets included in the bundle.

Accordingly, it is another objects of this invention to provide a machine for spreading the ends of a spring clip and driving the clip over the edge of a bundle and, subsequently, releasing the clip to engage the opposed faces of the bundle.

It is another object of this invention to provide a bundle clipping machine having a clip-spreading device and means for inserting a clip into the clip-spreading device without the necessity of special external forces for that purpose.

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It is another object of this invention to provide a bundle clipping machine having clip-handling apparatus, driving means for moving the clip-handling apparatus forwardly to apply a clip to a bundle and rearwardly to pick up another clip, and clip-loading apparatus adapted to load the next clip into the clip-handling apparatus as said driving means moves rearwardly, without the necessity of separate driving means for that purpose.

It is another object of this invention to provide a bundle clipping machine having a clip-engaging element and clip-spreading member in which means are provided for causing the clip-engaging element to drive the ends of a clip into the clip-spreading member at the end of each operational cycle without the application of special driving means for that purpose.

It is another object of this invention to provide a bundle clipping machine having a clip-guiding member, a clip loader, driving means therefor, and means for moving the clip loader forwardly to load a clip into the guiding member at the end of a withdrawal stroke of the driving means, the energy required for this loading operation being imparted by the driving means to the clip loader during a part of the previous operating cycle of the driving means and the clip loader being released by the movement of the driving means to its withdrawn position, whereby clips are loaded into the guiding member without the necessity of a separate driving means for that purpose.

This invention, together with further objects and advantages thereof, will best be understood by reference to the following description taken in connection with the accompanying drawings, and its scope will be pointed out in the appended claims.

In the drawings, in which like parts are indicated by like reference numerals,

Figure 1 is a top plan view of a machine, embodying the various features of this invention, with one cover plate partially broken away;

Fig. 2 is a side elevational view of the same machine;

Fig. 3 is a front end elevational view of the same machine;

Fig. 4 is a cross-sectional view taken along the line 4—4 of Fig. 1;

Fig. 5 is a cross-sectional view, similar to Fig. 4 but showing the machine in a different operating position;

Fig. 6 is a cross-sectional view of the same machine taken along the line 6—6 of Fig. 4;

Fig. 7 is a cross-sectional view taken along the line 7—7 of Fig. 5; and

Fig. 8 is a detail view taken from Fig. 4, showing certain parts of the machine in a different operating position.

At the forward end of the machine is a clip feeding device of which only the more pertinent parts are shown. A clip rack 11 is adapted to carry thereon clips 12, the clips sliding along the rack under the influence of springs or weights, not shown, in order that there may be a continuous supply of clips for the machine. An arm 13, actuated by a spring 14, maintains the clips in proper relationship to the rack 11 as the clips approach the operating portion of the machine.

The individual spring clips are picked up by the machine when the clip and the various operating elements of the machine are in the position shown in Figs. 1 and 4. A clip-engaging slide bar 21 is there shown in its rearwardmost position in which there is provided a small gap between the forward end of the slide bar and the rearward edge of the rack 11 for receiving a clip 12.

When an individual clip 12 reaches a position in alignment with the element 21, it is free to move forwardly since it has moved slightly beyond the end of the rack 11. As will subsequently be described, the slide bar 21

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now moves forwardly, or to the right in Figs. 1, 2, 4, 5, and 6, and drives the ends of the clip into a pair of jaws 22, these jaws having recesses 22a in their rearward faces for receiving the ends of the clip.

During this clip-loading operation the jaws are in their rearwardmost position and, in order that they may properly receive the clip, are spaced apart a suitable distance by forwardly extending bar 23. This bar is rigidly connected to the frame of the machine by screws 24 and is offset from the vertical center line of the jaws, as may be seen in Fig. 6, in order not to obstruct the forward path of the clips.

The slide bar 21 and the jaws 22 then move forwardly in conjunction and, as the jaws meet the edge of a bundle of plasterboard, shown in dotted lines at A in Fig. 5, they move outwardly from each other, the tapered faces 22b of the jaws riding smoothly over the corners of the bundle. This action spreads the ends of the clip and carries the clip over the edge of the bundle, as may be seen in Fig. 5.

It is apparent in view of the above that the slide bar serves to load the clips into the jaws and to maintain the clips therein during the clip-applying operation.

The jaws continue to move forwardly while the spring clip remains at the edge of the bundle with the result that the ends of the spring clip slide out of the recesses 22a and grip opposing faces of the bundle of plasterboard. The jaws are subsequently withdrawn and the clip engaging element 21 is returned to its rearwardmost position to pick up the next spring clip. The machine is then in readiness for a second, similar clip-applying operation. Preferably the bundles of plasterboard are moved past the front of the machine continuously in order that the jaws, in their return movement, will not strike the ends of the clip last applied to the bundle.

The clip-engaging slide bar 21 is actuated in the embodiment of the invention shown by a hydraulic cylinder 31 and the jaws are individually actuated by hydraulic cylinders 32. As previously indicated, it is necessary to make the slide bar 21 move forwardly a short distance prior to the commencement of forward movement by the jaws. One feature of this invention is the provision of means for automatically thrusting the slide bar forwardly this short distance just as the hydraulic mechanism 31 completes its rearward movement. This eliminates the need of a complex interlocking control system which would cause the slide bar to move forwardly with respect to the jaws as the various hydraulic drive means commence their forward actuation of the slide bar and the jaws.

One means which may be used for this purpose is the toggle mechanism best seen in Figs. 1 and 6. It will be shown that this toggle mechanism causes slide bar 21 to reach its rearwardmost or clip-receiving position prior to the completion of the rearward motion of the hydraulic mechanism 31 and that the subsequent rearward movement of that hydraulic mechanism causes the slide bar to move forwardly, forcing a clip into the recesses 22a of the jaws 22.

The toggle includes a yoke 33, supported by a sliding carriage 34 and driven by a piston rod 35 of the hydraulic mechanism 31. The carriage 34 slides on and is guided by rails 34a as the carriage and toggle mechanism move in the fore and aft directions.

Two pairs of adjustable supporting arms 36 are pivotally connected at their inner ends to the central portion of the yoke by pins 36a. The supporting arms are adjustably maintained in the desired position by screws 37, there being a pair of screws for each arm. The arms 36 are therefore maintained in fixed but adjustable position with respect to the yoke 33 by the pins 36a and the screws 37.

Between the outer ends of each pair of supporting arms is a block 38, pivotally mounted on the supporting arms by pins 39. Each of these blocks supports the

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outer end of a toggle arm, the latter being slidable with respect to the block.

The toggle arms consist primarily of a sleeve 41 and a rod 42 fitting snugly within the sleeve. The inner ends of the rods 42 are pivotally connected by pins 43 to crosshead 21a which in turn is connected to the slide bar 21.

The rods 42 and sleeves 41 are threaded together whereby their total length can be adjusted, and lock nuts 44 are provided to maintain the sleeve and rod adjustment. A helical spring 45 surrounds a portion of each sleeve 41 and is compressed between the block 38 and a shoulder 41a on the sleeve 41. The force of this spring urges the toggle arm to move inwardly of the block 38, and since the crosshead 21a, which is pivotally connected to the inner end of the rod 42, is adapted to slide in the yoke in the fore and aft direction only, the crosshead is urged either forwardly or rearwardly with respect to the yoke.

At the time that the hydraulic mechanisms 31 and 32 start their forward movement, the toggle mechanism is in the position shown in Fig. 1, the toggle arms being snapped forwardly with respect to the yoke and a clip being aligned with the slide bar 21 with its ends located in the recesses 22a of the jaws 22. As previously explained, the slide bar and the jaws are actuated independently by separate hydraulic mechanisms (the desirability of this arrangement will subsequently become apparent) and it is desirable to prevent the possibility of the jaws moving forwardly ahead of the slide bar since this might result in the spring clip dropping free of the jaws. Accordingly, a simple mechanical interlock is provided between the slide bar and the jaw actuating apparatus.

A pair of levers 51 are pivotally mounted by pins 52 on vertically extending arms 53 of the yoke 33. A pair of tension springs 54 are connected at one end to the yoke arms 53 and at their other ends to the rearward portions of the levers 51, the springs thereby urging the rearward ends of levers 51 inwardly with respect to the machine. When these levers are pivoted in this direction the rearwardmost ends are engaged by shoulders 55 on jaw actuating piston rods 32a. As long as this engagement is maintained the jaws 22 are prevented from moving forwardly with respect to the slide bar 21, and the spring clip ends will be held securely in the jaw recesses 22a by the slide bar.

In order to permit the jaws to move apart and spread the ends of the spring clip as they strike a bundle of plasterboard, jaw arms 22c are pivotally mounted by pins 61 on sliding carriages 62, these carriages being driven by piston rods 32a. Compression springs 63 are provided to urge the jaw arms 22c and the jaws 22 inwardly toward each other. Accordingly, when the tapered faces 22b of the jaws strike a bundle of plasterboard, the jaws slide outwardly and forwardly over the bundle, against the action of the springs 63.

At substantially the same time that the base of the spring clip comes into engagement with the side of the bundle a shoulder 21b on the slide bar engages a stationary frame member 65 of the machine and prevents further forward movement of the slide bar. It will be apparent that the conveyor apparatus, not shown, which carries the bundles of plasterboard past the front of the machine must be arranged to hold the side of the bundle adjacent the machine at a fixed distance therefrom. As the conveyor apparatus does not form a part of this invention it is believed unnecessary to describe it further.

Since the toggle arms were in their forward position at the beginning of the operation, as illustrated in Fig. 1, the yoke 33 can continue forwardly even though the slide bar has been stopped by engagement of the shoulders 21b with the frame member 65. During this continued forward movement of the yoke the outwardly extending ends of the toggle arms are carried forwardly of their inwardly

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extending ends with the result that the toggle arms snap into the position with respect to the yoke shown in Fig. 6. The forward movement of the yoke is preferably sufficiently rapid as to maintain the slide bar in its forwardmost position in spite of the rearward snapping movement of the toggle arms.

Also during this further forward movement of the yoke, rollers 51a, rotatably mounted on the forward ends of levers 51, engage sloping surfaces 66a of blocks 66. These blocks are adjustable in the fore and aft directions by screws 66b. As these rollers ride over these sloping surfaces, the forward ends of levers 51 are forced inwardly against the action of springs 54 and the rearward ends of the levers pivot outwardly, releasing shoulders 55.

Yoke 33 is now prevented from further rearward movement by engagement of the rearward end of crosshead 21a with a button 34b carried by and rigidly secured to yoke carriage 34. However, since the mechanical interlock between the yoke and the jaw actuating mechanism has now been rendered ineffective, the jaws move further forwardly, the ends of the spring clip slipping out of the jaw recesses and clamping opposed faces of the bundle as shown in Fig. 5.

Automatic control mechanism, not shown, now causes reverse movement of the hydraulic mechanisms 31 and 32. The toggle arms, having been snapped into their rearward positions as shown in Fig. 6, will remain there until forced again into their forward positions. Accordingly, the yoke and the slide bar move to the rear with crosshead 21a in engagement with button 34b of the yoke carriage.

However, as yoke 33 and yoke carriage 34 near their rearwardmost positions, which is determined by the engagement of a flange 34c with a stationary frame member 68, the rearward movement of slide bar 21 is ended by engagement of crosshead 21a with pins 69. These pins are rigidly secured to frame member 68 and are so located as to extend through aligned openings in yoke 33, yoke carriage 34 and flange 34c, provided for that purpose.

When the slide bar is in this rearwardmost position, the forwardmost end of the bar is located rearwardly of the clip rack 11 a sufficient distance to permit a clip to move into alignment with the slide bar. This permits loading of the machine for the next clipping operation.

Although the rearward movement of the slide bar and crosshead has been ended by engagement of the crosshead with pins 69, the yoke and yoke carriage continue rearwardly until flange 34c engages frame member 68. This additional movement of the yoke causes the outwardly extending ends of the toggle arms to be carried a minute distance beyond the center position of the toggle arms. This causes the toggle arms to snap forwardly again to the position shown in Fig. 1. Since the yoke 33 is permitted to move the toggle arm pivot pins 39 only slightly to the rear of the over center position of the toggle arms, the action of the toggle arms causes slide bar 21 to move forwardly of its rearwardmost position and force the ends of the newly loaded spring clip into the jaw recesses 22a, the jaws having in the meantime been moved to their rearwardmost or clip-receiving position by hydraulic mechanisms 32.

In the embodiment of this invention just described one form of various means are included for accomplishing the various objectives ascribed to the invention. The substantially independent drive means for the jaws and the slide bar permits the jaws to continue readily their forward movement after the forward progress of the slide bar has been stopped.

A simple mechanical interlock has been illustrated for assuring the proper engagement of the slide bar, the clip and the jaws during the forward motion of the slide bar and the clip.

A simple mechanical device has also been shown for imparting a short forward motion to the slide bar, and

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thereby loading a clip into the jaw recesses, as the slide bar driving means completes its rearward stroke. In the particular embodiment shown the energy for this short forward motion of the slide bar is supplied by the drive means during its rearward motion, stored momentarily, and then released by the approach of the drive means to its rearwardmost position. This simple mechanical device thereby eliminates need of a complex control interlock, which would otherwise be necessary, to cause a forward movement of the slide bar driving means prior to the beginning of the forward motion of the jaw actuating means.

It will be immediately apparent to those skilled in the art that the embodiment illustrated can be varied in many ways while still retaining the advantages thereof. For example, the means for spreading and guiding the clips and the means for interlocking the slide bar and the jaws can be of many diverse forms without substantially affecting their performance. Also, the toggle apparatus described can be of different form and different character and can be differently located without substantially affecting the results obtained therefrom.

While a particular embodiment has been shown, it will be understood, of course, that the invention is not limited thereto since many modifications may be made, and it is, therefore, contemplated to cover by the appended claims any such modifications as fall within the true spirit and scope of the invention.

The invention having thus been described, what is claimed and desired to be secured by Letters Patent is:

1. In a machine for applying spring clips to bundles, a pair of cooperating guide elements for guiding such a clip forwardly over the edge of such a bundle, each of said elements having an opening for receiving one end of a clip, said elements also having opposed sloping surfaces for sliding over the edge of such a bundle, and means for supporting said elements and driving said elements in the forward and rearward directions, said last named means permitting movement of said elements toward and away from each other alternately, to spread successive clips.

2. In a machine for applying spring clips to bundles, a pair of cooperating jaws, each of said jaws having a narrow recess for receiving one end of such a spring clip and for maintaining such a clip in a predetermined position with respect to said jaws, driving means for driving said jaws in forward and rearward directions, said jaws being pivotally mounted on said means for pivotal movement toward and away from each other and having opposed sloping surfaces adapted to slide over the edge of such a bundle, and means urging said jaws toward each other.

3. In a machine for applying spring clips to bundles, a pair of cooperating jaws, each of said jaws having a recess for receiving and aligning one end of such a spring clip, driving means for driving said jaws in a forward direction toward such a bundle, said jaws being pivotally mounted on said means for pivotal movement toward and away from each other and having opposed sloping surfaces adapted to guide said jaws outwardly away from each other and over the edge of such a bundle when said jaws are moved in a forward direction, whereby said clips may be spread and drawn over one edge of said bundles, and means urging said jaws toward each other.

4. In a machine for applying spring clips to bundles, guiding means for guiding such a clip forwardly into clamping engagement with such a bundle, a clip-engaging member for forcing a clip into engagement with said guiding means and maintaining such clip in such engagement during at least a portion of such forward motion of said guiding means, driving means adapted to move forwardly and rearwardly and transmit forward and rearward motion to said guiding means and said clip-engaging member, and means interconnecting said driving means and said clip-engaging member, said inter-

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connecting means absorbing energy from such motion, storing such energy for a period of time and releasing such energy to drive said clip-engaging member forwardly as said driving means completes its rearward motion.

5. In a machine for applying spring clips to bundles, guiding means adapted to receive the forwardly projecting ends of such a clip and to guide such clip ends outwardly and forwardly over one edge of such a bundle whereby such clip ends are moved to a position to engage two opposed faces of such a bundle, clip loading means for loading a clip into said guiding means and maintaining such clip therein throughout a substantial portion of the forward motion of said guiding means, drive means for driving said clip loading means rearwardly to a clip loading position and forwardly to so load and so maintain such a clip in said guiding means, and stop means for limiting the forward and rearward movement of said clip loading means, said drive means being adapted to continue its forward movement after said clip loading means is prevented from further forward movement by said stop means and being adapted to continue its rearward movement after said clip loading means is prevented from further rearward movement by said stop means, such continued movements of said drive means conditioning said clip loading means to move a short distance forwardly as said drive means completes its rearward movement, such short forward movement of said clip loading means being powered by energy received from said drive means during such continued movement of said drive means.

6. In a machine for applying spring clips to bundles, an element for engaging and moving such a clip forwardly toward such a bundle, stop means for limiting the forward and rearward movement of said element, said element when in its rearwardmost position being adapted to receive such a clip, pivotable guiding means adapted to receive the ends of such clips and to guide such clip ends outwardly and forwardly over one edge of such a bundle whereby such clip ends are moved to a position to engage two opposed faces of such a bundle, said guide means having grooves to receive the ends of said clips, said guide means also having cam surfaces for engaging such bundles to spread said guide means and hence said clips, drive means for said element, drive means for said guide means, interlock means interconnecting said guide means and said element whereby said guide means is restrained from forward movement with respect to said element, means for rendering said interlock means ineffective when said element has moved forwardly to affix said clip to said bundle, spring biased toggle means connecting said drive means and said element, said drive means being adapted to continue its forward motion after said element has reached its forwardmost position as determined by said stop means whereby said toggle means is caused to move over center, said drive means being adapted to continue its rearward movement only a short distance beyond the over-center position of said toggle means after said element has reached its rearwardmost position as determined by said stop means, whereby said toggle means forces said element a short distance forwardly, said element in turn forcing the ends of a clip into said guiding means.

7. In a machine for applying spring clips to bundles, an element for engaging and moving such a clip forwardly toward such a bundle, stop means for limiting the forward and rearward movement of said element, clip feeding means for feeding such clips into position to be engaged by said element when said element is in its rearwardmost position as determined by said stop means, guide means adapted to receive the ends of such clips and to guide such clip ends outwardly and forwardly over one edge of such a bundle whereby such clip ends are moved to a position to engage two opposed faces of such a bundle, means interconnecting said element and said

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guide means to prevent forward motion of said guide means with respect to said element substantially throughout the forward motion of said element, tripping means rendering said interconnecting means inoperative after said element has substantially completed its forward motion, first drive means for said guide means, second drive means for said element, and toggle means connecting said second drive means and said element, said second drive means being adapted to continue its forward motion after said element has reached its forwardmost position as determined by said stop means whereby said toggle means is caused to move over center, said second drive means also being adapted to continue its rearward movement only a short distance beyond the over-center position of said toggle means after said element has reached its rearwardmost position as determined by said stop means, whereby said toggle means forces said element a short distance forwardly, said element in turn forcing the ends of a newly fed clip into said guide means.

8. In a machine for applying spring clips to bundles, guide elements movable forwardly and rearwardly for guiding such clips forwardly into clamping engagement with such bundles, said guide elements having opposed sloping surfaces for sliding over the edge of a bundle and each having a recess for receiving one end of a clip, said guide elements being arranged for movement toward and away from each other whereby forward movement of said sloping surfaces over the edge of a bundle may cause movement of said elements away from each other to spread a clip engaged in said recesses, driving means movable forwardly and rearwardly for transmitting forward and rearward motion to said guide elements, a clip engaging member movable forwardly and rearwardly for forcing the ends of a clip into said recesses of said guide elements, and toggle means interconnecting said driving means and said clip engaging member, said toggle means absorbing energy from the motion of said driving means, storing such energy, and releasing such energy to drive said clip engaging member forwardly as said driving means completes its rearward movement to force the ends of a clip into said recesses of said guide elements.

9. In a machine for applying spring clips to bundles, guide elements movable forwardly and rearwardly for guiding such clips forwardly into clamping engagement with such bundles, said guide elements having opposed sloping surfaces for sliding over the edge of a bundle and each having a recess for receiving one end of a clip, said guide elements being arranged for movement toward and away from each other whereby forward movement of said sloping surfaces over the edge of a bundle may cause movement of said elements away from each other to spread a clip engaged in said recesses, a clip engaging member movable forwardly and rearwardly for forcing the ends of a clip into said recesses of said guide elements and for bearing against such clip to retain the ends of such clip in said recesses during at least a portion of the forward movement of said guide elements, driving means movable forwardly and rearwardly for transmitting forward and rearward motion to said guide elements and to said clip engaging member, and toggle means interconnecting said driving means and said clip engaging member, said toggle means transmitting a portion of such forward and rearward motion of said driving means to said clip-engaging member, whereby said clip engaging member moves in conjunction with said guide elements during at least a portion of such movement of said guide elements, said toggle means absorbing a portion of the energy of such motion of said driving means, storing such energy, and releasing such energy to drive said clip engaging member forwardly as said driving means completes its rearward movement.

10. In a machine for applying spring clips to bundles, guide elements movable forwardly and rearwardly for

guiding such clips forwardly into clamping engagement with such bundles, said guide elements having opposed sloping surfaces for sliding over the edge of a bundle and each having a recess for receiving one end of a clip, said guide elements being arranged for movement toward and away from each other whereby forward movement of said sloping surfaces over the edge of a bundle may cause movement of said elements away from each other to spread a clip engaged in said recesses, driving means movable forwardly and rearwardly for transmitting forward and rearward motion to said guide elements, a clip engaging member movable forwardly and rearwardly for forcing the ends of a clip into said recesses of said guide elements, stop means for limiting the forward and rearward movement of said clip engaging member, and toggle means interconnecting said driving means and said clip engaging member, said toggle means being moved over center by forward movement of said driving means after said clip engaging member has engaged said stop means to prevent further forward movement of said clip engaging member, said toggle means being again moved over center by rearward movement of said driving means after said clip engaging member has engaged said stop means to prevent further rearward movement of said clip engaging member, and further stop means for restricting rearward movement of said driving means to only a short distance beyond the over center position of said toggle means after said clip engaging member has reached its rearwardmost position as determined by said first-mentioned stop means, whereby said toggle means forces said clip engaging member a short distance forwardly of its rearwardmost position to force the ends of a clip into said recesses of said guide elements.

11. In a machine for applying spring clips to bundles, guide elements movable forwardly and rearwardly for guiding such clips forwardly into clamping engagement with such bundles, said guide elements having opposed sloping surfaces for sliding over the edge of a bundle and each having a recess for receiving one end of a clip, said guide elements being arranged for movement toward and away from each other whereby forward movement of said sloping surfaces over the edge of a bundle may cause movement of said elements away from each other to spread a clip engaged in said recesses, a clip engaging member movable forwardly and rearwardly for forcing the ends of a clip into said recesses of said guide

elements and for bearing against such clip to retain the ends of such clip in said recesses during at least a portion of the forward movement of said guide elements, driving means movable forwardly and rearwardly for transmitting forward and rearward motion to said guide elements and to said clip engaging member, stop means for limiting the forward and rearward movement of said clip engaging member, and toggle means interconnecting said driving means and said clips engaging member, said toggle means transmitting a portion of such forward and rearward motion of said driving means to said clip engaging member whereby said clip engaging member moves in conjunction with said guide elements during at least a portion of said movement of said guide elements, and said toggle means being moved over center by continued forward movement of said driving means after said clip engaging member has engaged said stop means to prevent further forward movement of said clip engaging member, said toggle means being again moved over center by continued rearward movement of said driving means after said clip engaging member has engaged said stop means to prevent further rearward movement of said clip engaging member, and further stop means for restricting rearward movement of said driving means to only a short distance beyond the over center position of said toggle means after said clip engaging member has reached its rearwardmost position as determined by said first-mentioned stop means, whereby said toggle means forces said clip engaging member a short distance forwardly of its rearwardmost position to force the ends of a clip into said recesses of said guide elements.

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