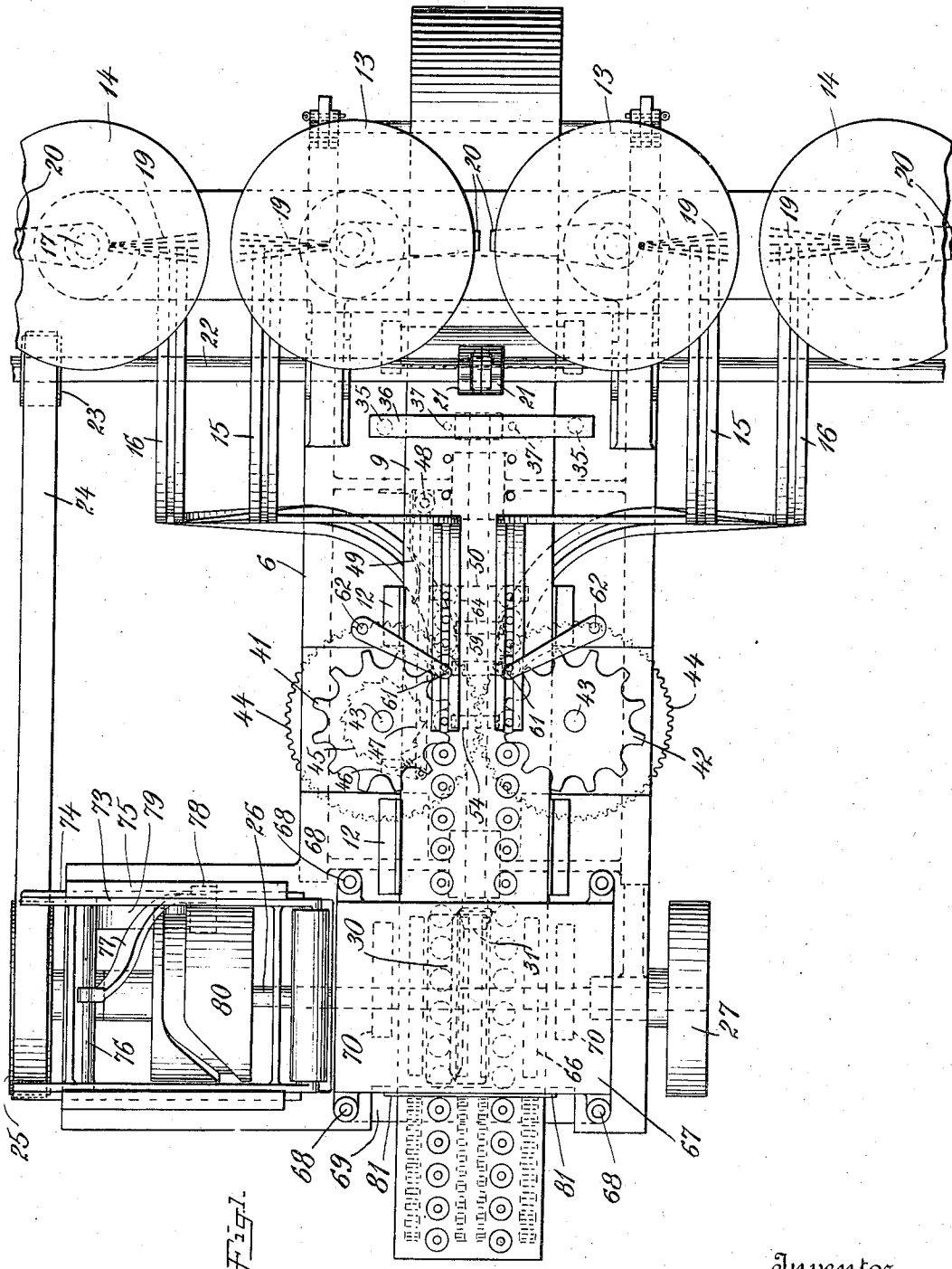


R. H. BERKLEY.
MACHINE FOR CARDING SNAP FASTENERS.
APPLICATION FILED JUNE 5, 1918.

1,307,997.

Patented June 24, 1919.

3 SHEETS—SHEET 1.



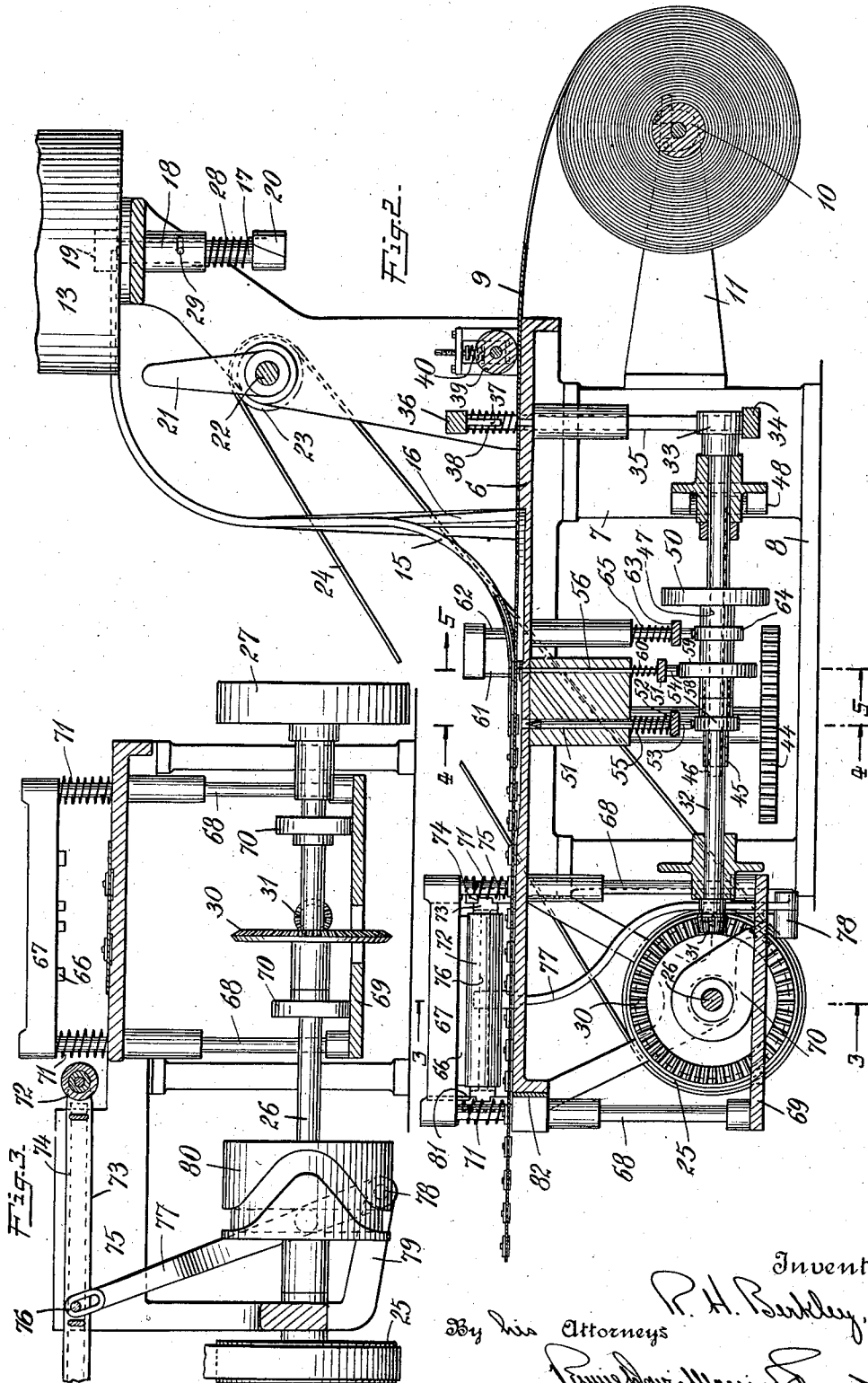
Inventor
R. H. Berkley.
By *Law* Attorneys
Paul Davis Martin & Co.

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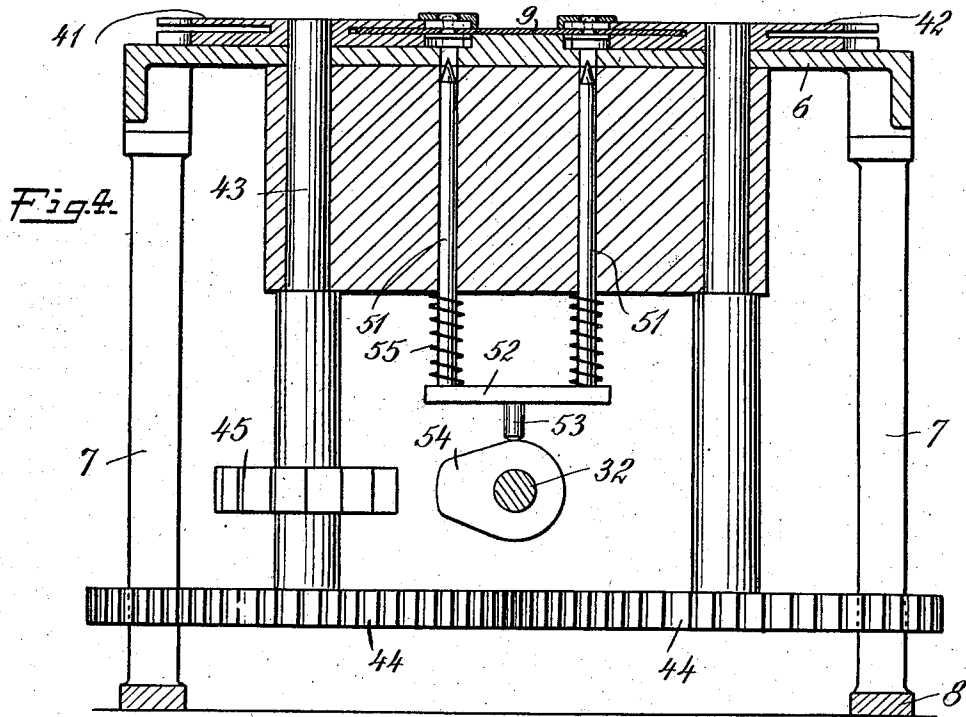
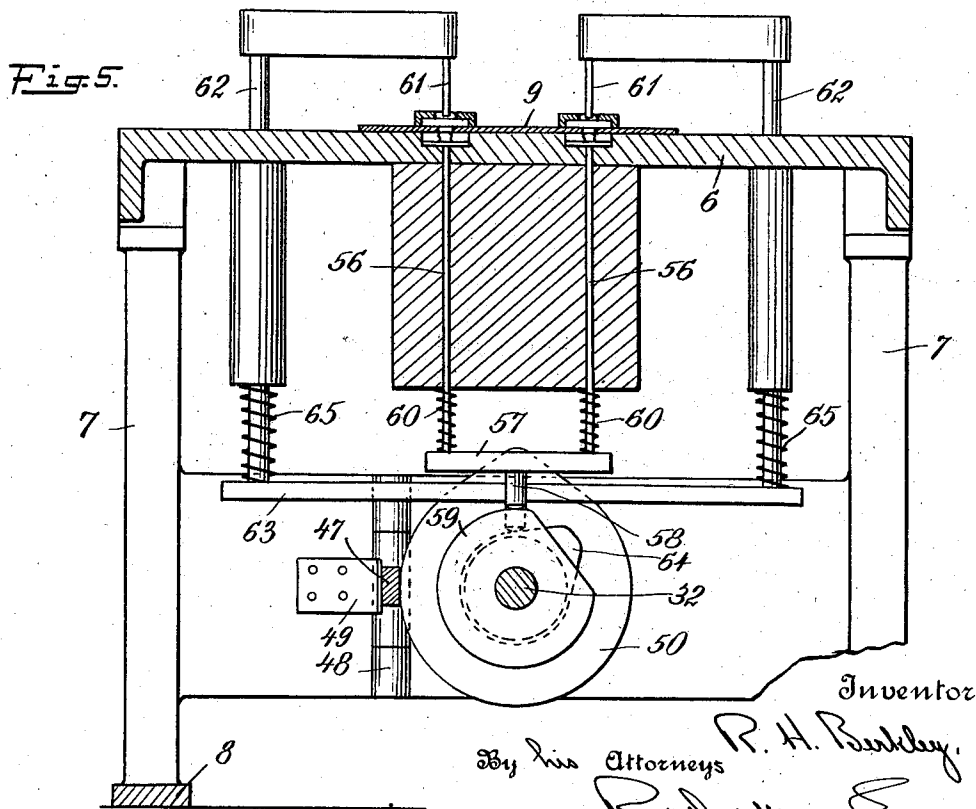
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

RICHARD HATLEY BERKLEY, OF PLAINVILLE, MASSACHUSETTS, ASSIGNOR TO
WHITING & DAVIS COMPANY, A CORPORATION OF NEW YORK.

MACHINE FOR CARDING SNAP-FASTENERS.

1,307,997.

Specification of Letters Patent. Patented June 24, 1919.

Application filed June 5, 1918. Serial No. 238,357.

To all whom it may concern:

Be it known that I, RICHARD H. BERKLEY, a citizen of the United States, residing at Plainville, in the county of Norfolk, State of Massachusetts, have invented certain new and useful Improvements in Machines for Carding Snap-Fasteners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is directed to the provision of a machine for automatically affixing snap fasteners to cards for convenience in handling them and displaying them for sale.

It has become the common practice to mount snap fasteners on cards for convenience in handling them and displaying them for sale by providing holes in a card and then affixing the snap fasteners to the card by passing the studs of the stud members through the holes and snapping the socket members upon the studs, the bodies of the stud members and socket members lying on opposite sides of the card. The operation of so affixing snap fasteners to the cards has heretofore been a manual operation which adds materially to the cost of the completed product. The object of this invention is to provide a mechanism for performing this operation mechanically and automatically to the end that the cost of the carded fasteners shall be materially reduced.

The invention involves the provision of an automatic feeding mechanism for feeding cards to an affixing position, automatic mechanism for feeding stud and socket members of snap fasteners successively from suitable supply receptacles to positions on opposite sides of the card in the affixing position, and an automatically operated pusher or pressing device which, when the stud and socket members are in the proper relation to the card, is operated to force the two members toward each other and thereby snap them together upon the card with the stud of the stud member projecting through a hole in the card. If desired, the cards may be supplied from a continuous strip of paper which is fed forward by automatic feeding mechanism and at the conclusion of the operation of affixing the studs, the strip may be severed at the appropriate points to form cards. The machine may also be provided with an automatically operated punch which

punches the holes in the cards to prepare them for receiving the fasteners.

In such a mechanism it is essential that the members of the fasteners be positioned accurately with respect to the card, so that when they are moved toward each other, the studs of the stud members will be inserted through the holes in the card. For this purpose, various forms of positioning devices may be employed but I prefer to use a toothed wheel in the form of a gear mounted to rotate step by step so that in each step movement of the wheel a tooth thereon will engage the members of a fastener and advance them, the wheel coming to rest when the members of the fastener advanced by it have reached the proper position with respect to the card. In order to eliminate the possibility of jamming of the parts by the succeeding teeth of the gear engaging the members of a succeeding fastener, an automatically operated stop device may be employed for retaining the succeeding fasteners until they may be allowed to move forward by gravity without danger of coming into engagement with the ends of the teeth on the toothed wheel.

In preparing such cards of snap fasteners for sale, it is usual to provide printed matter upon the cards, such as a fanciful border more or less inclosing a group of fasteners, such as a half dozen or dozen, or descriptive or advertising matter. The machine for carding the fasteners may be arranged to print upon the cards in addition to applying the fasteners thereto. For this purpose the cards or the continuous strip of connected cards may be arranged to pass over a suitable printing bed or platen and a printing member consisting of a form of type or an electrotpe may be moved into engagement with the card during one of the periods of rest of its step by step movement the type being suitably inked after each printing operation.

Apparatus for carding snap fasteners in accordance with the principles of this invention may be constructed in various ways differing widely as to their structural characteristics, and for that reason the present invention is not to be understood as limited with respect to the structural features employed except as may be indicated by the claims appended hereto. One form in which the invention may be embodied is illustrated

in the accompanying drawings. In these drawings Figure 1 is a plan view of the apparatus broken away in part; Fig. 2 is a sectional elevation of the machine; and Figs. 3, 4, and 5 are transverse sections on lines 3—3, 4—4 and 5—5 respectively of Fig. 2.

Referring to these drawings, the machine includes a bed plate 6 supported by standards 7 from a base 8. The continuous strip of connected cards is shown at 9, this strip being wound upon a roller 10 which is mounted for rotation in arms 11 secured to the frame of the machine. The strip is fed step by step over the surface of the bed plate 6, it being guided to move in a straight line by suitable guides such as those shown at 12 (Fig. 1).

The receptacles for the socket and stud members are shown at 13 and 14 respectively. In the present instance two receptacles for stud members and two for socket members are shown as the machine is arranged to affix the snap fasteners to the cards in two parallel rows extending in the direction of the length of the strip of connected cards. Each of these receptacles 13 and 14 is provided with an opening at the bottom thereof into which the end of a guideway extends. The cross-sectional shape of each of these guideways corresponds accurately to the cross-sectional shape of the fastener member which is to pass through it so that the members can enter the guideway only in the relation appropriate for co-action with the other mechanism of the machine to affix the fasteners to the cards. The guideways leading from the receptacles 13 for the socket members are shown at 15, and the guideways leading from the receptacles 14 for the stud members are shown at 16. Each of these guideways is provided with a groove or slot in its upper wall to receive the stud of the stud members and the upper ends of the sockets of the socket members. Each of the receptacles 13 and 14 is provided with a suitable agitator arranged to sweep over or adjacent to the entrance to the delivery groove leading from the receptacle and thus cause the fastener members to enter the groove. In the present instance each of the receptacles is shown as provided with a short shaft 17 adapted to rock in a sleeve bearing 18 affixed to the bottom of the receptacle. Within the receptacle the upper end of the shaft 17 carries a radial brush 19. On the lower end of each shaft 17 is a crank arm 20 and the several crank arms 20 are adapted to be engaged periodically by the ends of arms 21 mounted upon a shaft 22. This shaft 22 is mounted for rotation in suitable bearings and is provided with a pulley 23 which receives a belt 24. This belt also runs on a pulley 25 affixed to a power shaft 26 to which rotary motion is communicated in any suitable

manner as by a belt running on the pulley 27. During each rotation of the shaft 22 the arms 21 thereon strike the arms 20 of the shafts 17 and rotate those shafts and the brushes 19 carried by them and when the arms 21 are carried past the cranks 20 the shafts 17 and their brushes 19 are returned to their original positions by springs 28 coiled on the shafts 17 as indicated in Fig. 2. The range of movement of the shafts 17 may be limited by pins 29 on the shafts 17 entering slots in the bearings for the shafts.

The guideways 15 leading from the receptacles 13 for the socket members extend downwardly and toward each other and then out parallel to each other over the surface of the bed plate 6. Near their ends the bottom walls of these guideways are cut away so that when the socket members arrive at this point they rest upon the paper strip 9 on the bed plate 6, their movement from this point on to the end of the guideway being guided by its side walls. The guideways 16 leading from the receptacles 14 for the stud members extend downwardly and toward each other and communicate with grooves formed in the bed plate 6 as shown in Fig. 2, so that the stud members passing down through these guideways pass into the grooves in the plate 6 and move along thereunder the paper strip 9 into lines paralleling the lines of socket members which overlie the strip.

The power shaft 26 carries a beveled gear 30 which meshes with a pinion 31 on a shaft 32 extending lengthwise of the machine and mounted in suitable bearings carried by the standards 7. On one end this shaft 32 carries a cam 33 which operates upon a crossbar 34 whose ends are secured to rods 35 passing up through bearings on the plate 6 on opposite sides of the strip 9. The upper ends of these rods 35 are connected by a bar 36 from which depend two punches 37 lying directly over holes in the bed plate 6 corresponding accurately in size to the punches 37. Springs 38 are coiled on the rods 35 between the plate 6 and bar 36 for raising the punches 37 and maintaining the bar 34 always in engagement with the cam 33. A roller 39 is preferably provided immediately in rear of the punches 37, this roller being pressed down by springs 40 into engagement with the paper strip 9 to hold the strip flat upon the surface of the plate 6.

The feed of the members of the fasteners and the positioning of those members is controlled by two toothed wheels 41 and 42 which are set into recesses in the bed plate 6. These wheels are mounted on shafts 43 adapted to rotate in bearings formed in a block secured to the underside of the bed plate 6 and on their lower ends these shafts

carry intermeshing gears 44. On one of the shafts 43 is a ratchet wheel 45. This wheel and the parts connected to it are rotated step by step by a pawl 46 (Fig. 1) pivotally mounted on the end of a lever 47 which is pivoted upon one of the standards 7 as shown at 48. The lever 47 is pressed by a spring 49 into engagement with the periphery of a cam 50 mounted on the shaft 32. Once during each rotation of the shaft 32 the cam 50 actuates the lever 47 and pawl 46 to rotate the shafts 43 and the wheels 41 and 42 carried thereby one step, that is, a distance represented by the space between adjacent teeth of the wheels. In each such step movement, one tooth of each of the wheels engages the leading stud member and socket member in the corresponding guideways 15 and 16 and moves those members forward to the positions for affixing them to the card. By reference to Fig. 4 it will be noted that each of the wheels 41 and 42 is slotted circumferentially to provide a narrow space for the reception of the paper strip 9.

Immediately after each pair of fastener members is brought to the affixing position by the toothed wheels 41 and 42, a pusher or pressing member is raised into engagement with the stud members underlying the paper strip and lifts them so as to project the studs through holes in the paper strip 9 and into the sockets of the overlying socket members. These pushers are shown at 51 in Fig. 4. They are adapted to move vertically in openings provided in the block underlying the bed plate 6. At their lower ends they are secured to a cross head 52 on which is a projection 53 bearing on the periphery of a cam 54 on the shaft 32. Springs 55 are coiled on the rods 51 and tend to press the crosshead 52 downwardly to hold the projection 53 upon the surface of the cam 54.

The toothed wheels 41 and 42 might be allowed to pick up the fastener members successively, the fasteners being advanced into coaction with the teeth of the wheels by gravity. However, this would admit of the possibility of a fastener member becoming jammed between the end of a tooth of one of the wheels and the opposite side wall of the guideway. I prefer therefore to control the movement of the fastener members under the action of gravity into coaction with the toothed wheels. For this purpose automatically operated stops are provided which arrest the movement of the members in the guideways under the action of gravity and release them momentarily when the wheels 41 and 42 are at rest. These stop members are shown in Fig. 5. The lower stop members consist of rods 56 movable vertically in the block secured to the under-side of the bed plate 6, the ends of which are adapted to enter the studs of the stud members. The

lower ends of these rods 56 are secured to a crosshead 57 provided with a projection 58 adapted to bear on the periphery of a cam 59 on the shaft 32, springs 60 coiled on the rods 56 being arranged to hold the projection 58 in engagement with the cam. The upper stop members 61 are carried by rods 62 secured to a crosshead 63 whose projection is adapted to travel on the periphery of a cam 64 on the shaft 32, it being held in engagement with the cam by springs 65. The upper stop members 61 are slightly forward of the lower stop members 56 and are adapted to be moved down into the path of movement of the upper ends of the socket members.

The mechanism for printing upon the cards and for severing the strip 9 is shown at the left of Figs. 1 and 2 and in Fig. 3. The extension of the bed plate 6 constitutes a platen for the support of the paper strip during the printing operation. A printing member is mounted directly over this platen; it may consist of a form of type but it is preferably an electrotpe plate. This plate is indicated at 66 as carried by a supporting plate 67. This supporting plate 67 is mounted upon rods 68 extending down through bearings formed on the bed plate 6 and secured at their lower ends to a crosshead 69 engaged by two similar cams 70 on the power shaft 26. These cams serve to depress the crosshead 69 and the plate 67 carrying the electrotpe against the tension of springs 71 coiled on the rods 68. When the printing surface is in the elevated position an inked roller 72 is passed over the printing face of the electrotpe. This roller is carried by a frame 73 the sides 74 of which are adapted to slide in ways 75 mounted on the frame of the machine. One of the cross-rods 76 of the frame 73 passes through a slot in an operating lever 77 pivoted at its lower end as shown at 78 upon an arm 79 depending from the frame 75. On lever 77 is a roller which lies in the groove of a cam 80 carried by the shaft 26.

The plate 67 which carries the electrotpe has a cutting blade 81 mounted upon it. This blade coöperates with the edge of a plate 82 which is secured to the end of the bed plate 6.

The operation of the mechanism constructed as above set forth will now be described. Throughout the operation, the brushes 19 in the receptacles for the fastener members are operated intermittently to sweep over the entrances to the guideways 15 and 16 and agitate the fastener members so as to cause them to enter the guideways, and the shape of the guideways is such that these members may enter them only in the proper relation. Within the guideways, the members move along by gravity down to the point where they are arrested by the detents

56 and 61. At regular intervals the cams 59 and 64 operate the detents to move them momentarily out of engagement with the fastener members held by them, and while they are so out of engagement, the fastener members are moved by gravity in the guideways. Thus, referring to Fig. 1, the movement of the detents to the positions for releasing the fastener members permits the members to move so that the end one of the series in each guideway moves forward a distance approximately equal to its diameter and into engagement with a tooth of the coacting wheel 41 or 42. The detent is quickly returned to its arresting position and is engaged by the next fastener member so as to arrest the movement of the series of fastener members in the guideway actuated by gravity. Fastener members are thus supplied to the positioning and feeding wheels 41 and 42 by the action of gravity under the control of the detents. At regular intervals, that is, once for each rotation of shaft 32 the wheels 41 and 42 are operated by the ratchet and pawl mechanism 45 and 46 so that the fastener members supplied to the wheels as above described are moved forward by the wheels to the affixing positions. Immediately after the wheels come to rest after moving the fastener members to the affixing positions, the pusher or pressing members 51 are raised by their cam 54 into engagement with the stud members and cause those members to project their studs through the holes in the paper strips and into the sockets of the socket members. This affixes the fasteners to the strip 9 so that when the wheels 41 and 42 are given their next step of rotational movement they act as feeders for the paper strip, the teeth of the wheels engaging the fasteners which have just been affixed to the strip and moving them together with the strip one step forward. Also, in each rotation of the shaft 32 the punches 38 are operated to punch holes in the strip 9 in the positions appropriate for the reception of fasteners in the subsequent positions of the strip.

The machine illustrated is arranged for the production of cards each containing a dozen fasteners arranged in two rows of six each. Therefore the printing mechanism is arranged to be operated after every sixth step of the affixing mechanism, the ratio between the beveled gears 30 and 31 being six to one. In the pause after each sixth step movement of the paper strip, the cams 70 depress the printing plate 66 and cause it to print upon the paper strip passing over the bed plate. After the printing surface has been returned to its initial position, and while it is in that position, the inking roller 72 is moved over the printing faces in contact therewith by the cam 80 to supply ink for the succeeding printing operation. Also,

each time the printing member is depressed the cutter plate 81 carried by it severs the strip 9 forming a printed card carrying a dozen snap fasteners.

The toothed wheels herein illustrated and described for controlling the movement of the fastener members and positioning them accurately for coöperation with the pusher by which pairs of fastener members are united, is especially well adapted for the performance of the functions above indicated, particularly when the wheels are slotted as above described to provide space through which the strip of paper moves, but it is to be understood that the invention is not limited to the use of such toothed wheels, except as may be indicated in certain of the appended claims, as some of the features of the invention may be utilized in machines wherein other means are employed for performing the functions of the toothed wheels. One of the important features of the invention consists in the utilization of a pair of guideways through which the fastener members pass having their end portions lying parallel and close together but separated by a space through which the sheet of paper passes, the adjacent side walls of these end portions of the two guideways being cut away so that after the fastener members have moved through the guideways to positions adjacent to the points at which they are affixed to the cards they are free to move laterally into coaction carrying the stud of a stud member through the opening in the card and into the socket of the corresponding socket member.

I claim:

1. A machine for carding snap fasteners, comprising the combination of two guideways for the socket and stud members of snap fasteners which guideways have their end portions extending parallel to each other and spaced apart to permit a sheet to pass between them and have the adjacent walls of the end portions cut away to permit lateral movement of the fastener members after they have been moved into the end portions of the guideways, a pusher, means for operating the pusher to move the fastener members of a pair toward each other to cause the stud of the stud member to pass through an opening in the sheet and into the socket of the corresponding socket member, and means for feeding the sheet forward step by step to present new points on the sheet for the reception of new pairs of members.

2. A machine for carding snap fasteners, comprising the combination of two guideways for the socket and stud members of snap fasteners which guideways have their end portions extending parallel to each other and spaced apart to permit a sheet to pass between them and have the adjacent walls

of the end portions cut away to permit lateral movement of the fastener members after they have been moved into the end portions of the guideways, a pusher, means for operating the pusher to move the fastener members of a pair toward each other to cause the stud of the stud member to pass through an opening in the sheet and into the socket of the corresponding socket member, and feeding means for feeding the sheet forward step by step to present new points on the sheet for the reception of new pairs of members by coaction with the fasteners which have been affixed to the sheet.

3. A machine for carding snap fasteners, comprising the combination of two guideways for the socket and stud members of snap fasteners which guideways have their end portions extending parallel to each other and spaced apart to permit a sheet to pass between them and have the adjacent walls of the end portions cut away to permit lateral movement of the fastener members after they have been moved into the end portions of the guideways, a pusher, means for operating the pusher to move the fastener members of a pair toward each other to cause the stud of the stud member to pass through an opening in the sheet and into the socket of the corresponding socket member, a punch operated in accordance with the movement of the pusher to punch holes in the sheet, and feeding means for feeding the sheet forward step by step to present new points on the sheet for the reception of new pairs of members.

4. A machine for carding snap fasteners, comprising the combination of two guideways for the socket and stud members of snap fasteners which guideways have their end portions extending parallel to each other and spaced apart to permit a sheet to pass between them and have the adjacent walls of the end portions cut away to permit lateral movement of the fastener members after they have been moved into the end portions of the guideways, a pusher, means for operating the pusher to move the fastener members of a pair toward each other to cause the stud of the stud member to pass through an opening in the sheet and into the socket of the corresponding socket member, means for feeding the sheet forward step by step to present new points on the sheet for the reception of new pairs of members, and a printing mechanism operated in the periods of rest of the step by step movement of the sheet to print upon the sheet.

5. A machine for carding snap fasteners, comprising the combination of two guideways for the socket and stud members of snap fasteners which guideways have their end portions extending parallel to each other and spaced apart to permit a sheet to pass between them and have the adjacent walls

of the end portions cut away to permit lateral movement of the fastener members after they have been moved into the end portions of the guideways, a pusher, means for operating the pusher to move the fastener members of a pair toward each other to cause the stud of the stud member to pass through an opening in the sheet and into the socket of the corresponding socket member, means for feeding the sheet forward step by step to present new points on the sheet for the reception of new pairs of members, and a cutter operated in certain of the periods of rest of the step by step movement of the sheet to cut the sheet and form cards therefrom.

6. A machine for carding snap fasteners, comprising the combination of a support for a card, means for feeding the stud and socket members of snap fasteners to opposite sides of the card, a pusher, a power shaft connected to the pusher for operating it to move the stud members of the fasteners to carry the studs through holes in the card and into the sockets of the corresponding socket members, and a printing member connected to the power shaft and actuated thereby to print upon the cards to which the snap fasteners are affixed.

7. A machine for carding snap fasteners, comprising the combination of a support for a card, means for feeding the card forward step by step consisting of feeding members which coact with the fasteners which have been affixed to the card, a punch operated in accordance with the step by step feeding movement of the card to punch holes in the card, means for supplying stud and socket members of snap fasteners to opposite sides of the card, and a pusher operated in accordance with the step by step movement of the card to engage a stud member and project its stud through a hole formed in the card by the punch and into the socket of a socket member.

8. A machine for carding snap fasteners, comprising a support for a card, a toothed wheel, means for supplying stud and socket members to the toothed wheel on opposite sides of the card, means for moving the toothed wheel to carry the fastener members to the affixing position with reference to the card and pusher, and means for operating the pusher to engage a stud member and project its stud through a hole in the card and into the socket of the socket member.

9. A machine for carding snap fasteners, comprising the combination of a support for a card, receptacles for the stud and socket members of the snap fasteners, guideways leading from the receptacles to positions opposite each other and close together on opposite sides of a card upon the support, means for feeding a card over the surface of

the support and between the two guideways, and means for moving each stud member to carry its stud through an opening in the card and into the socket of the corresponding socket member.

10. A machine for carding snap fasteners, comprising the combination of a support, means for feeding a card over the surface of the support step by step, receptacles for the stud and socket members of the fasteners, guideways leading from the receptacles to opposite sides of the card on the support, an automatically operated punch for punching holes in the card and means for moving each stud member to carry its stud through a hole punched in the card and into the socket of the corresponding socket member.

11. A machine for carding snap fasteners, comprising the combination of a support for a card, receptacles for the stud and socket members of the fasteners, guideways leading from the receptacles to positions opposite each other and close together on opposite sides of the card on the support, means for moving each stud member to project its stud through a hole in the card and into the socket of the socket member, and means for feeding the card forward between the two guideways step by step by coaction with the fasteners affixed to the card.

12. A machine for carding snap fasteners, comprising the combination of a support for a card, a toothed wheel for moving the stud and socket members into the affixing position, guideways through which the stud and socket members pass to the wheel on opposite sides of the card, means for controlling the movement of the members in the guideways into coaction with the wheel, and means for moving each stud member to project its

stud through a hole in the card and into the socket of the socket member.

13. A machine for carding snap fasteners, comprising the combination of a support for a card, a toothed wheel provided with a slot through which the card passes, means for supplying stud and socket members of snap fasteners to the wheel on opposite sides of the card, means for actuating the wheel to position the members of a fastener relatively to the card and to feed the card by coaction with the fastener affixed to the card, and means for moving each stud member in the affixing position to carry its stud through a hole in the card and into the socket of the socket member.

14. A machine for carding snap fasteners, comprising the combination of a support for a paper strip, means for feeding the strip over the support, means for supplying stud and socket members of snap fasteners to opposite sides of the strip, means for moving each stud member to project its stud through a hole in the strip and into the socket of the socket member, and a cutter for cutting the strip to form cards.

15. A machine for carding snap fasteners, comprising the combination of a support for a strip, means for feeding the strip over the support step by step, a punch operated periodically to punch holes in the strip, means for supplying stud and socket members of fasteners to opposite sides of the strip, means for moving each stud member to project its stud through a hole punched in the strip and into the socket of the socket member, and a cutter for cutting the strip into cards.

In testimony whereof I affix my signature.
RICHARD HATLEY BERKLEY.