

Aug. 2, 1938.

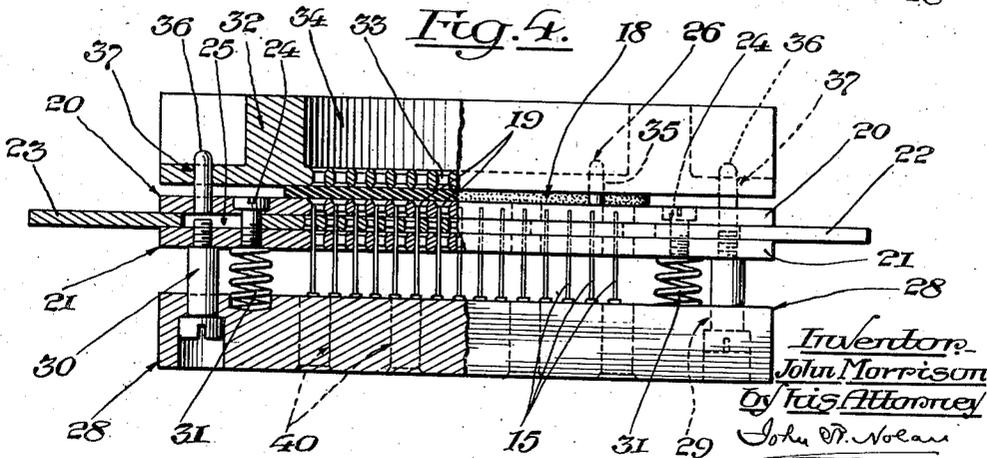
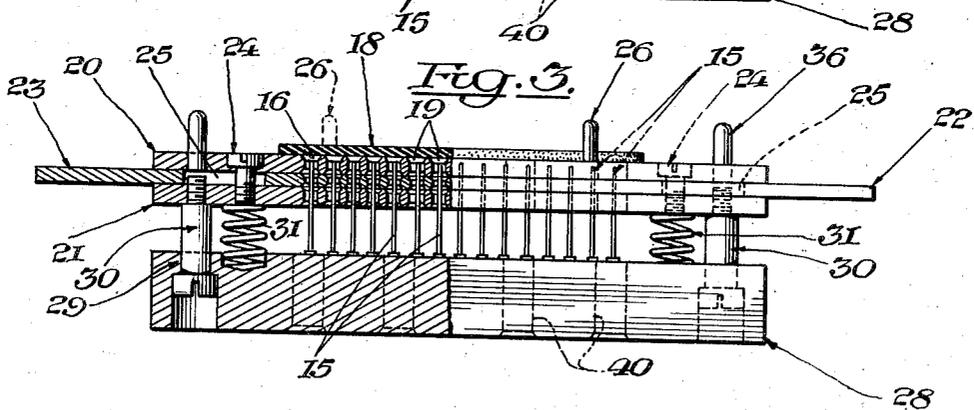
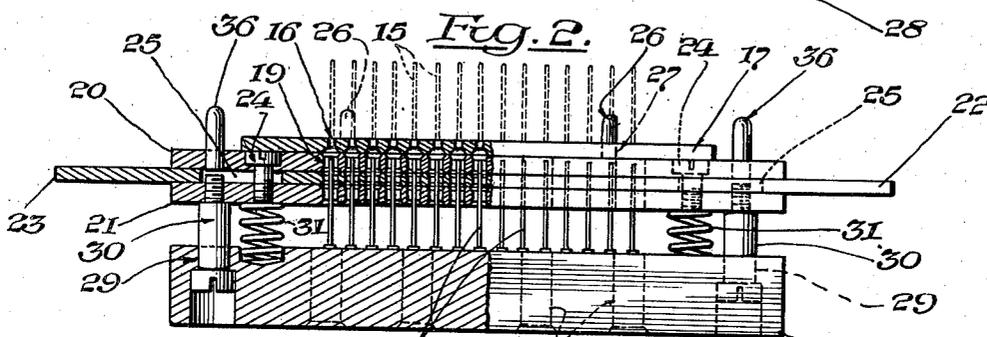
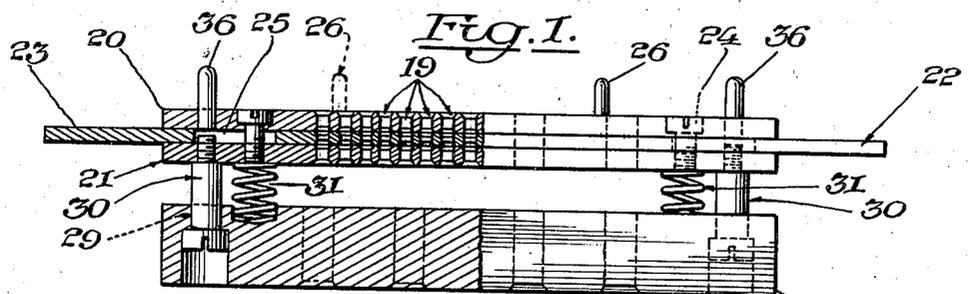
J. MORRISON

2,125,735

METHOD OF AND MEANS FOR APPLYING PINS TO FLEXIBLE BRUSH BACKS AND THE LIKE

Filed July 24, 1937

2 Sheets-Sheet 1



Aug. 2, 1938.

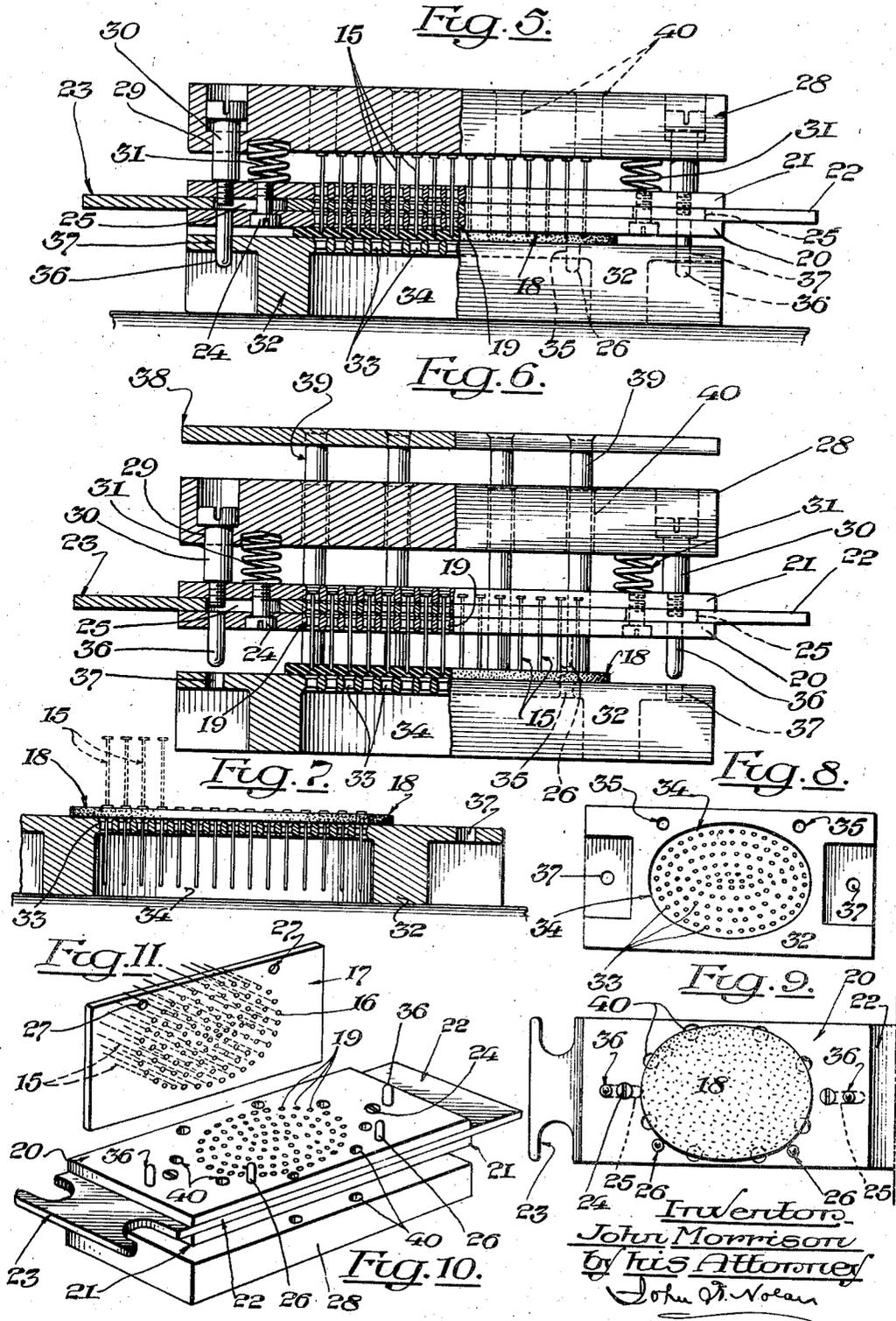
J. MORRISON

2,125,735

METHOD OF AND MEANS FOR APPLYING PINS TO FLEXIBLE BRUSH BACKS AND THE LIKE

Filed July 24, 1937

2 Sheets-Sheet 2



# UNITED STATES PATENT OFFICE

2,125,735

## METHOD OF AND MEANS FOR APPLYING PINS TO FLEXIBLE BRUSH BACKS AND THE LIKE

John Morrison, Mamaroneck, N. Y., assignor to  
Ox Fibre Brush Company, Inc., New York, N. Y.,  
a corporation of Delaware

Application July 24, 1937, Serial No. 155,499

17 Claims. (Cl. 300—21)

This invention relates to a method of and means for applying headed pins to a flexible backing, especially, though not exclusively, a rubber backing of the kind used in the manufacture of pin brushes.

The principal object of my invention is to mount in flexible backing material in a simple and efficient manner a multiplicity of pins which are accurately arranged in spaced relation throughout an area of determined size and contour in conformity with the requirements of a brush head, for example, to which the pin-studded back is to be applied.

An exemplifying form of the invention in its adaptation to the manufacture of pin-studded elastic backs for brush heads, is herein shown and described, the scope of the invention being expressed in the appended claims.

In the drawings—

Figure 1 is a sectional elevation of a brush pin applying apparatus embodying the principle of my invention.

Fig. 2 is a similar elevation showing an inverted pin assembly plate positioned on the apparatus, the pins being free of the assembly plate and supported, heads downward, on a base block included in the apparatus, the shanks of the pins being freely sustained in vertical position by an upper guide structure and the initial position of the pins in the assembly plate being indicated by dotted lines.

Fig. 3 is a similar elevation showing flexible backing material substituted for the pin-freed assembly plate.

Fig. 4 is a similar elevation showing the vertically supported pins temporarily clamped in the guide structure and showing also a foraminated pin-shank receiving element imposed on the flexible backing.

Fig. 5 is a similar elevation showing the assembled elements of Fig. 4 as inverted, the base block being partially pressed down upon the pin heads, and the points of the pins entered in the opposing surface of the backing material.

Fig. 6 is a similar elevation showing a stripper element mounted and arranged to bear on the backing material, the pin shanks being indicated as released in the guide structure, and the base block as partially raised.

Fig. 7 is a longitudinal vertical section of the inverted pin shank receiving element as removed and supporting the backing and its associated brush pins, showing the pins as pressed through the backing and indicating by dotted lines the previous position of the pins in the backing.

Fig. 8 is a view of the recessed or chambered side of the pin shank receiving element.

Fig. 9 is a plan view of the apparatus with the flexible backing imposed thereon as shown in Fig. 3.

Fig. 10 is a perspective view of the apparatus as shown in Fig. 1.

Fig. 11 is a similar view of the pin-filled assembly plate preparatory to its placement on the apparatus.

In carrying out my invention in the form illustrated the usual headed pins 15 are inserted in and suspended throughout the perforated area 16 of an assembly plate 17, which area ordinarily corresponds in contour with that of the brush head to which the rubber back 18 (when studded with pins) is adapted to be applied in any usual or approved manner. The plate 17 with its pin assembly is placed in inverted position, pin heads downward, upon a similarly perforated plate structure, as indicated in Fig. 2, the perforations 19 of which structure are large enough in cross-section for the free passage of the heads of the pins when the assembly is in horizontal position. This structure comprises a top plate 20 and a bottom plate 21 in fixed spaced relation, together with a longitudinally slidable interposed plate 22 having at one end a projecting handle 23. The associated plates have correspondingly perforated areas, the perforations of the top and bottom plates being in fixed vertical alignment, and those of the slide plate being movable into and out of axial alignment with the other perforations. The top and bottom plates are conveniently connected by means, for example, of screws 24 which pass freely through suitably located slots 25 in the slide plate 22. The top plate 20 is provided adjacent one of its longitudinal edges with short upstanding studs 26 which mate with corresponding holes 27 in the assembly plate 17 and are properly positioned to maintain the perforations of the latter in registry with the perforations of the top plate 20. Under the bottom plate 21 is a base block 28 having adjacent its ends vertical guide openings 29 for pins 30 secured to and depending from the bottom plate 21 which guide means insures the parallel relation of the plate structure and base block. Such structure is maintained normally spaced from the base block by compression springs 31 which are suitably interposed between the block and the adjacent plate 21.

Preparatory to placing the pin-filled plate 17 flatwise upon the guide plate 20, the intermediate plate 22 is disposed to bring its perfora-

tions into axial alignment with those of the plates 20 and 21. Consequently the group of pins gravitates, heads downward, through the perforations of the associated plates 20, 21 and 22, the heads of the pins resting uniformly upon the base 28 and their upstanding ends lying just below the upper surface of the plate 20, as seen in Fig. 2. The slide plate 22 by actuation of its handle 23 is then slightly moved longitudinally, thus pinching and holding the pins of the group in spaced parallel relation against the walls of their respective perforations in the plates 20 and 21, as seen in Fig. 4. The assembly plate 17 free of the pins 15 is then removed, and the rubber back 18 is placed upon the plate 20 over the assembled pins 15, the edge of the back abutting and being centralized by upstanding studs 26 on the latter, as seen in Fig. 3.

A pin shank receiving element comprising in the present instance a plate 32 having a perforated area 33 corresponding with that of the assembly plate and also having a recess or chamber 34 in its upper surface is next placed upon the rubber back, as seen in Fig. 4, the plate 32 being accurately positioned by the upstanding studs 26 on the plate 20 mating with suitably-disposed holes 35 in the plate 32 and also by additional end studs 36 on the plate 20 mating with end holes 37 in the plate 32. Vertical pressure is then applied to the plate 32 in a manner to depress the rubber back 18 and the plate structure 20, 21, 22 against the force of the springs 31, thus entering the points of the groups of pins in the opposing surface of the back; it being noted that there is not sufficient friction or pressure brought to bear on the pins by the plate 22 to prevent the free passage of the pins to the extent of entering the rubber back. The assembled elements are inverted, as seen in Fig. 5, and the plate 32, recessed surface downward, is supported upon a suitable table or bed. Upon the removal of the applied pressure the block 28 is raised by the recoil of the springs 31. A stripper member consisting, in the present instance of a plate 38 with legs 39 is applied to the device and forced downward, the legs being entered in suitably-disposed guide holes 40 in the block 28 and the associated perforated plates so as to bear at intervals against the opposing margin of the rubber back 18, thus separating such back from the surface of the pin guide plate 21 to which it adheres and holding the back flatwise against the upper surface of the pin shank receiving element 32. While the back is held in this way the slide plate is shifted to release the group of pins and the plate structure 20, 21, 22 is lifted as seen in Fig. 6, the legs 39 remaining upon the backing material until the structure clears the brush pins. This done, the plate structure, together with the associated stripper is removed, the backing material 18 with the pins therein in spaced parallel relation, heads upward, remaining upon the element 32, as indicated in Fig. 7. The pins 15 are then simultaneously pressed through and beyond the rubber back and through the perforations 33 into the chamber of the member 32 by means, for example, of any flat faced element which bears uniformly upon the heads of the group of pins, thus completing the pin-applying operation. The pin-studded elastic back thus produced is then removed from the element 32 and the hereinbefore described operation is repeated in connection with the succeeding rubber backs and pin groups therefor.

It is to be understood that the exemplifying method and means herein disclosed may be varied

and modified within the fair spirit of the invention and the scope of the appended claims.

I claim:

1. In a method of applying pins to flexible backing material, the steps of placing a group of pins, heads down, in the perforated area of a pin guiding element whereof each perforation is of sufficient size in cross-section for the free passage of the head of a pin; supporting the heads of the said pins upon a base element; temporarily securing the pins in the respective perforations of the guiding element; placing backing material upon the said guiding element and above the pins; placing a pin-shank receiving element upon the said backing material; and effecting opposing relative movement between the pin-shank receiving element and the heads of the group of pins in a manner to enter the pins in spaced parallel relation in the opposing surface of the backing material.

2. In a method of applying pins to flexible backing material, the steps of placing a group of pins, heads down, in the perforated area of a pin guiding element whereof each perforation is of sufficient size in cross-section for the free passage of the head of a pin; supporting the heads of the said pins upon a base element; temporarily securing the pins in the respective perforations of the guiding element; placing backing material upon the said guiding element and above the pins; placing a pin-shank receiving element upon the said backing material; effecting opposing relative movement between the pin-shank receiving element and the heads of the group of pins in a manner to enter the pins in spaced parallel relation in the opposing surface of the backing material; shifting the pin-shank receiving element and the guiding element in spaced relation, and stripping from the guiding element the backing material carrying the pins.

3. In a method of applying pins to flexible backing material, the steps of placing a group of pins, heads down, in the perforated area of a pin guiding element whereof each perforation is of sufficient size in cross-section for the free passage of the head of a pin; supporting the heads of the said pins upon a base element; temporarily securing the pins in the respective perforations of the guiding element; placing backing material upon the said guiding element and above the pins; placing a pin-shank receiving element upon the said backing material; effecting opposing relative movement between the pin-shank receiving element and the heads of the group of pins in a manner to enter the pins in spaced parallel relation in the opposing surface of the backing material; shifting the pin-shank receiving element and the guiding element to spaced relation; stripping from the guiding element the backing material carrying the pins; removing the pin-shank receiving element and the opposed backing material and pins, and pressing the pins simultaneously through the backing material until the pin heads abut the backing material.

4. In a method of applying pins to flexible backing material, the steps of freely suspending a group of headed pins in the perforated area of a pin assembling element; placing the said element in inverted position, pin heads down, upon the correspondingly perforated area of a pin guiding element whereof the perforations are in axial alignment, or substantially so, with those of the assembling element and whereof each perforation is of sufficient size in cross-section for the free passage of the head of a pin; supporting

the heads of the pins upon a base element; temporarily securing the pins in the respective perforations of the guiding element; removing the assembling element free of the pins; placing backing material upon the said guiding element and above the pins; placing a pin-shank receiving element upon the said backing material; and effecting opposing relative movement between the pin-shank receiving element and the heads of the group of pins in a manner to enter the pins in spaced parallel relation in the opposing surface of the backing material.

5. In a method of applying pins to flexible backing material, the steps of freely suspending a group of headed pins in the perforated area of a pin assembling element; placing the said element in inverted position, pin heads down, upon the correspondingly perforated area of a pin guiding element whereof the perforations are in axial alignment, or substantially so, with those of the assembling element and whereof each perforation is of sufficient size in cross-section for the free passage of the head of a pin; supporting the heads of the pins upon a base element; temporarily securing the pins in the respective perforations of the guiding element; removing the assembling element free of the pins; placing backing material upon the said guiding element and above the pins; placing a pin-shank receiving element upon the said backing material; effecting opposing relative movement between the pin-shank receiving element and the heads of the group of pins in a manner to enter the pins in spaced parallel relation in the opposing surface of the backing material; shifting the pin-shank receiving element and the guiding element to spaced relation, and stripping from the guiding element the backing material carrying the pins.

6. The method of applying pins to flexible backing material, consisting in freely suspending a group of headed pins in the perforated area of a pin assembling element; placing the said element in inverted position, pin heads down, upon the correspondingly perforated area of a pin guiding element whereof the perforations are in axial alignment, or substantially so, with those of the assembling element and whereof each perforation is of sufficient size in cross-section for the free passage of the head of a pin; supporting the heads of the pins upon a base element; temporarily securing the pins in the respective perforations of the guiding element; removing the assembling element free of the pins; placing backing material upon the said guiding element and above the pins; placing a pin-shank receiving element upon the said backing material; effecting opposing relative movement between the pin-shank receiving element and the heads of the group of pins in a manner to enter the pins in spaced parallel relation in the opposing surface of the backing material; shifting the pin-shank receiving element and the guiding element to spaced relation; stripping the backing material from the guiding element; removing the pin-shank receiving element and the imposed backing material and pins, and pressing the pins simultaneously through said backing material until the heads abut the backing material.

7. In an apparatus for applying headed pins to a flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the

free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element including means for temporarily holding said pins in said perforations, base means for supporting the heads of pins sustained in said perforations, and means for movably supporting the pin guiding element in parallel relation to the base means.

8. In an apparatus for applying headed pins to a flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element including means for temporarily holding said pins in said perforations, base means for supporting the heads of pins sustained in said perforations, and means for resiliently supporting the pin guiding element in parallel relation to the base means, the last-named means comprising guide pins fixed to the pin guiding element and slidable in the base means, and supporting springs interposed between the said pin guiding element and base means.

9. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element including correspondingly perforated plate members in superposed relation and slidable relatively to each other so as to clamp or release the pins extending through the mating holes of the respective plates, as desired.

10. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element including correspondingly perforated plate members in superposed relation and slidable relatively to each other so as to clamp or release the pins extending through the mating holes of the respective plates as desired, base means for supporting the heads of the inverted pins sustained in said perforations, and means movably supporting said pin guiding element and base means in parallel relation.

11. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element including a correspondingly perforated member which receives the shanks of pins and is operative to hold or release the pins in the said guiding element, as desired, base means for supporting the heads of the pins sustained in said perforations, and means including a spring element for resiliently supporting said guiding element and base means in parallel relation.

12. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to sup-

port the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element comprising two plates fixed in spaced parallel relation and having correspondingly perforated areas whereof the perforations are in axial alignment, and also an intermediate slidable pin-holding plate having a correspondingly perforated area shiftable into and out of axial alignment with the perforations of the companion plates.

13. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element comprising two plates fixed in spaced parallel relation and having correspondingly perforated areas whereof the perforations are in axial alignment; and also having an intermediate slidable pin-holding plate having a correspondingly perforated area shiftable into and out of axial alignment with the perforations of the companion plates, base means for supporting the heads of the pins sustained in the perforations of the respective plates, and connections providing for a parallel movement between said base means and pin guiding element.

14. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element comprising two plates fixed in spaced parallel relation and having correspondingly perforated areas whereof the perforations are in axial alignment, and also an intermediate slidable pin-holding plate having a correspondingly perforated area shiftable into and out of axial alignment with the perforations of the companion plates, base means for supporting the heads of the pins sustained in the perforations of the respective plates, and means including a spring element for resiliently supporting said guiding element in spaced parallel relation to the base means.

15. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed

on said element, said element including means for temporarily holding said pins in the perforations, base means for supporting the protruding heads of the pins, means supporting and guiding said base means in parallel relation to the said pin guiding element, and a pin shank receiving element adapted to be imposed on the backing material after such material has been placed on said pin guiding element.

16. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element including means for temporarily holding said pins in the perforations, base means for supporting the protruding heads of the pins, means supporting and guiding said base means in parallel relation to the guiding element, a pin-shank receiving element adapted to be imposed on the backing material after such material has been placed on said pin guiding element, and a stripper for removing the adherent backing material from the opposing surface of the guiding element and maintaining the material upon the said pin-shank receiving element after the organization has been inverted and the points of the pins entered in the opposing surface of the backing material.

17. In an apparatus for applying headed pins to flexible backing material, a pin guiding element having a perforated area adapted to support the backing material, the perforations being of sufficient size in cross-section for the free passage therethrough of the respective pins, heads downward, before the backing material is placed on said element, said element including means for temporarily holding said pins in the perforations, base means for supporting the protruding heads of the pins, means supporting and guiding said base means in parallel relation to the pin guiding element, a pin-shank receiving element adapted to be imposed on the backing material after such material has been placed on said pin guiding element, and a stripper for removing the adherent backing material from the opposing surface of the pin guiding element and maintaining it upon the said pin-shank receiving element after the organization has been inverted and the points of the pins entered in the opposing surface of the backing material, said stripper comprising a series of spaced parallel legs insertable in and movable through registering apertures in the said base means and pin guiding element so as to bear upon the margins of the backing material.

JOHN MORRISON.