July 4, 1950

R. J. SAILER

2,514,013

WORK FOLDING AND GUIDING ATTACHMENT FOR SEAMING MACHINES

Filed Sept. 25, 1947

2 Sheets-Sheet 1

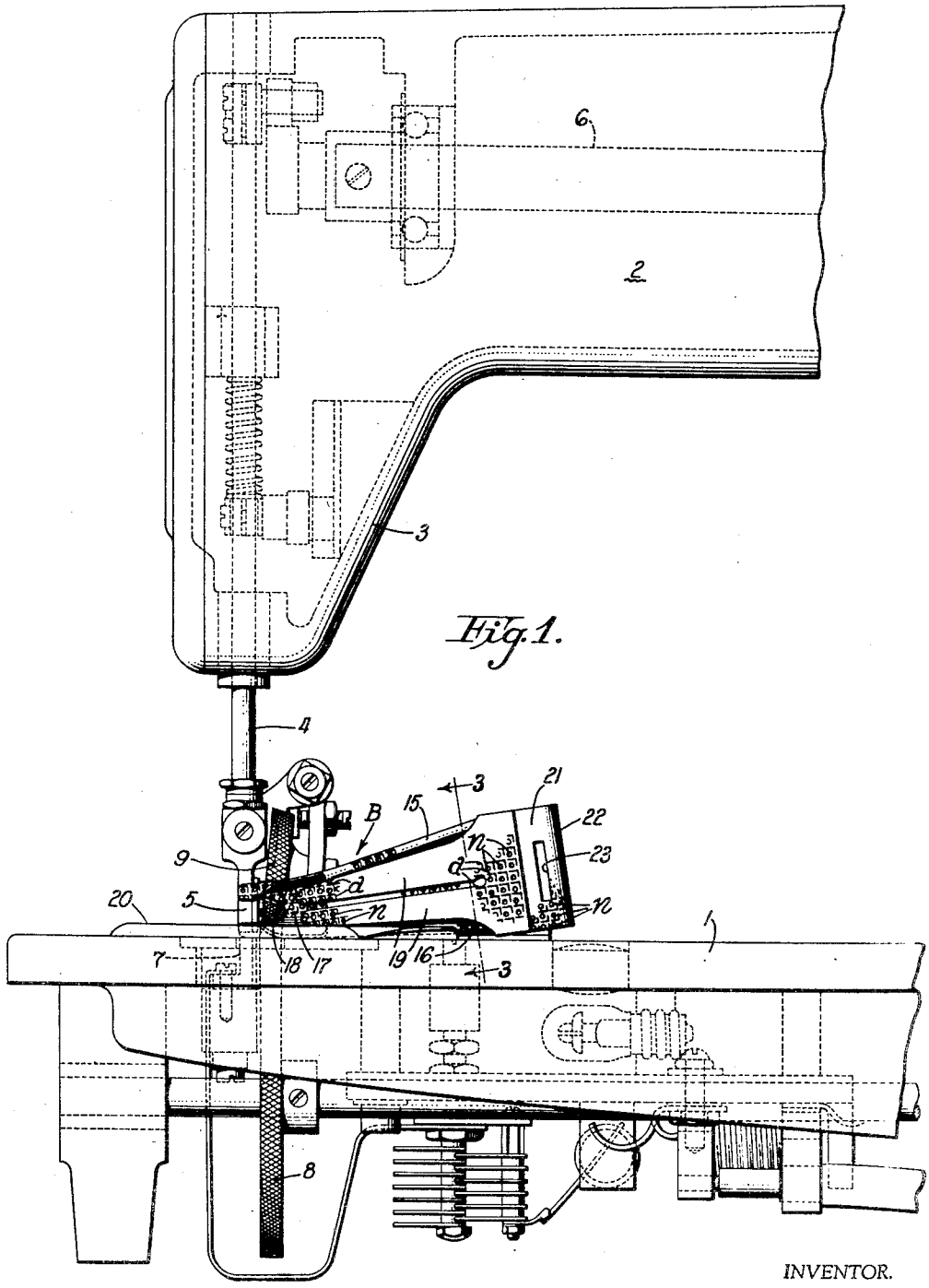



Fig. 1.

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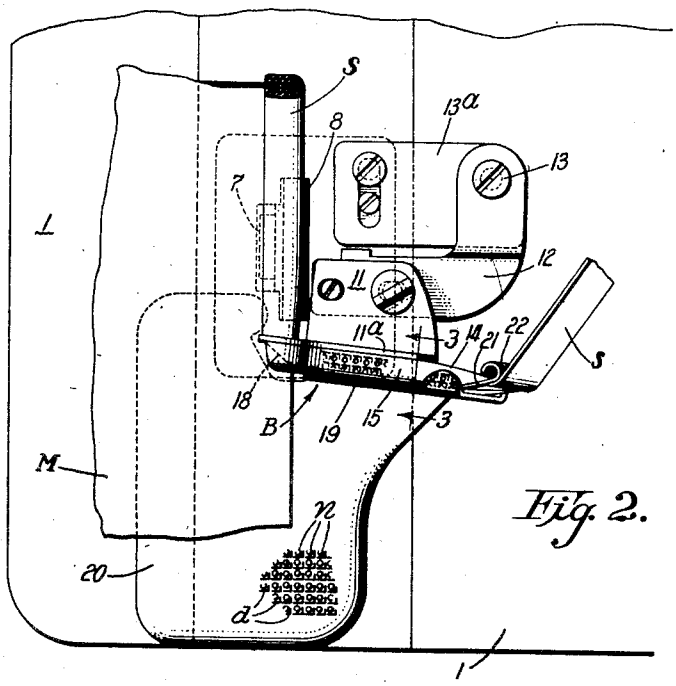



Fig. 2.

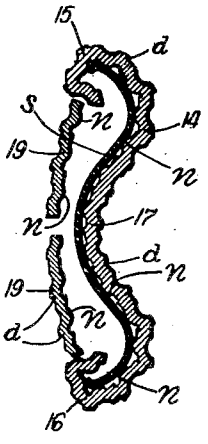



Fig. 3.

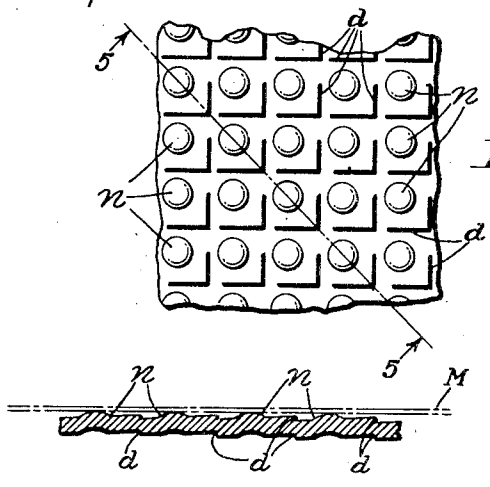



Fig. 4.

Fig. 5

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# UNITED STATES PATENT OFFICE

2,514,013

## WORK FOLDING AND GUIDING ATTACHMENT FOR SEAMING MACHINES

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Application September 25, 1947, Serial No. 776,017

1 Claim. (Cl. 154—42)

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This invention relates to work folding and guiding attachments for seaming machines and it has as an object to provide improved attachments which are capable of handling materials having adherent characteristics, with greater ease and facility than was possible with attachments heretofore available.

Examples of materials which tend to adhere or cling to attachments through which they are passed are rubberized fabrics, imitation leather, patent leather and the various thermoplastic sheet materials more or less recently developed.

To make articles of wearing apparel, and other articles, of such thermoplastic sheet materials it has become common practice to pass plies of such materials between opposed electrodes of electrostatic bonding machines which heat and soften the materials and press them together, thus forming a bonded or welded seam.

In the manufacture of certain articles it is necessary, or desirable, to cover edges of the sheet materials with a strip of binding material and to attach the binding strip to the materials during the bonding operation. Attempts to perform this binding operation, by the use of a regular sewing machine binder applied to a bonding machine, have not proven satisfactory due to the fact that the binding strip adheres to the walls of the binder and does not flow freely therethrough. This condition is aggravated in a humid atmosphere in which the adherent tendency of the binding material is greatly increased.

In the performance of certain operations it is essential, or desirable, that the binding strip be passed through a so-called "strip-reversing" or English type binder in which the binding strip is led into the binder from the operator's right side and has its marginal portions folded inwardly. After this initial folding of the binding strip, the folded strip is passed around an inclined strip-reversing edge and is folded about the edges of the material to be bound, after which the material and the binding strip are fed away from the operator or, in other words, in a direction substantially at right angles to its initial movement through the binder. In its passage through the binder, the strip is in contact with the walls of the binder.

While binders of this nature are entirely satisfactory for the handling of ordinary fabric strips it has been found unpracticable to use them for folding strips of thermoplastic sheet material because the clinging of the strip to the binder interferes with the feed thereof and the consequent stretching of the binding strip results in distortion of the strip when it reaches the bonding station.

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Another difficulty experienced in the attempted use of conventional sewing machine binders for handling binding strips of thermoplastic sheet material, is that the strip frequently carries a charge of static electricity generated by the handling of the strip, or otherwise, which, when the strip is passed through the binder, causes the strip to be drawn electrically into frictional contact with the walls of the binder. This friction adds to the adherence of the strip to the binder due to the adherent character of the material and thereby further prevents free passage of the strip through the binder.

Still another force which causes the thermoplastic material to adhere to the surfaces of a conventional smooth metal attachment is friction caused by atmospheric pressure. The thermoplastic material is impervious to air and its passage over smooth surfaces tends to wipe out the air therebetween, thus creating a partial vacuum. Atmospheric pressure on the opposite side of thermoplastic material then forces the material into frictional contact with the smooth surfaces of the attachment, thereby further resisting its free passage through the attachment.

This invention has as its primary object to provide an improved attachment which will satisfactorily fold and pass strips of material which normally have a tendency to adhere to the walls of conventional attachments.

Another object of this invention is to provide an improved attachment for material-seaming machines which will eliminate, to a large degree, the adherence of the material to the walls of the attachment under the action of static electricity and atmospheric pressure.

While this invention is shown and described as embodied in a transverse binder for electrostatic bonding machines for thermoplastic sheet materials, it is to be understood that the invention also is adaptable to other types of guiding and/or folding attachments for both bonding and sewing machines.

The above mentioned difficulties have been overcome, and the objects of the invention have been attained, by the provision of an attachment in which the walls thereof which come into contact with the material, are provided with a multitude of relatively small and spaced-apart raised surfaces which afford, in effect, point contacts with the material, as distinguished from the flat and smooth surfaces of prior attachments. These point contacts satisfactorily guide the material

but afford only a minimum of area to which the material may stick due to its inherent adhesive characteristics. These point contacts also greatly lessen the friction between the strip and the attachment heretofore caused by atmospheric pressure and the action of static electricity in the strip.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

Fig. 1 is a side elevation of a portion of an electrostatic bonding machine fitted with one of my improved binding attachments.

Fig. 2 is a plan view of a portion of the work-supporting plate of the machine shown in Fig. 1 with the improved binding attachment thereon.

Fig. 3 is an enlarged transverse sectional view taken on the lines 3—3 of Figs. 1 and 2.

Fig. 4 is an enlarged plan view of a portion of sheet metal from which the improved attachment advantageously may be made.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

Referring more specifically to the drawings, the invention is disclosed as embodied in a strip reversing binder B attached to the work-supporting bed 1 of an electrostatic bonding machine. The bonding machine also includes an overhanging bracket-arm 2 which terminates in a head 3 in which is reciprocably mounted a bar 4 carrying, at its lower end, an upper electrode 5. The bar 4 is reciprocated by any suitable means from a rotary shaft 6 journaled lengthwise in the bracket-arm 2. Cooperating with the upper electrode 5 is a lower electrode 7. The work is held and fed through the machine and between the electrodes by a serrated feed-wheel 8 located beneath the work and a cooperating roller presser 9 which is carried by a spring-depressed presser-bar, not shown, mounted in the head 3. Inasmuch as the construction and operation of the bonding machine form no part of this invention, further illustration and description thereof is deemed unnecessary.

It is to be understood that an electrostatic bonding machine is only one example of a seaming machine with which my improved attachments may be used to advantage and that the improved attachments are equally adaptable to other forms of seaming machines, such, for example, as sewing machines.

As illustrated in the drawings, the improved attachment comprises an L-shaped supporting bracket 11 secured to an arm 12 pivotally connected, at 13, to a plate 13a attached to the bed 1 of the machine. Secured to the upstanding portion 11a of the bracket 11 is the binder head comprising a body member 14 having edge-folding scrolls 15 and 16, a center folding portion 17 having, at the delivery end of the binder, angularly disposed strip-reversing edges 18, and a bifurcated strip-guiding tongue 19. The attachment also includes a horizontally disposed work-supporting apron 20 over which the body material M (Fig. 2) passes in its travel to the binder head.



At its intake end, the binder head is provided with a strip-guiding plate 21, having a backwardly curved rear end 22, over which an unfolded portion of a binding strip S passes. The plate 21 is also provided with a slot 23 adapted to guide pre-folded binding strips to the binder-head.

To reduce adherence of the binding strip S to the binder-head, and of the body material M to the work-supporting apron 20, the body member 14, scrolls 15, 16, strip guiding tongue 19 and apron 21 are preferably formed of sheet metal having rough or uneven surfaces which contact the binding strip and the body material, as distinguished from the smooth, polished surfaces of prior devices. These rough or uneven surfaces may be obtained in any suitable manner but preferably they are obtained by punching or pressing, from flat stock, a multitude of small rounded nodules *n*. The parts are then made from the pressed stock so that the nodules will project toward, and form relatively small contact areas for, the binding strip and the body material. From an inspection of Figs. 3, 4 and 5 it will be apparent that these nodules afford in effect, point contacts with the work as distinguished from the large surface contacts of prior attachments, thereby greatly reducing friction due to adhesion, electrical attraction and atmospheric pressure.

During the formation of the nodules *n* the sheet metal between the nodules may also be deflected out of its normal plane, as indicated at *d* in Figs. 3, 4 and 5. This deflection of the metal adds greatly to its rigidity and thereby permits the use of thinner metal than would otherwise be practicable.

From the foregoing it will be perceived that this invention has provided an improved guiding and/or folding attachment for seaming machines which is capable of satisfactorily and effectively handling thermoplastic sheet material, for which purpose no suitable attachment was heretofore available.

Having thus set forth the nature of the invention, what I claim herein is:

A strip-reversing binder for folding a smooth-surfaced non-filamentary material and for guiding such material to a seaming machine, comprising, a binder head having a body portion provided with curved edge-folding scrolls and a curved center folding portion affording angularly disposed strip-reversing edges, and a curved strip-guiding tongue opposed to said center folding portion, said center folding portion, scrolls and tongue each being formed of sheet metal stock of which the strip-engaging face is covered with closely spaced raised nodules pressed from the body material of the stock, such strip-engaging faces thereby affording spaced metal islands which engage the strip at intervals and hold it out of contact with the major portions of the elements of said binder head.

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