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APPARATUS FOR PACKAGING SAFETY PINS

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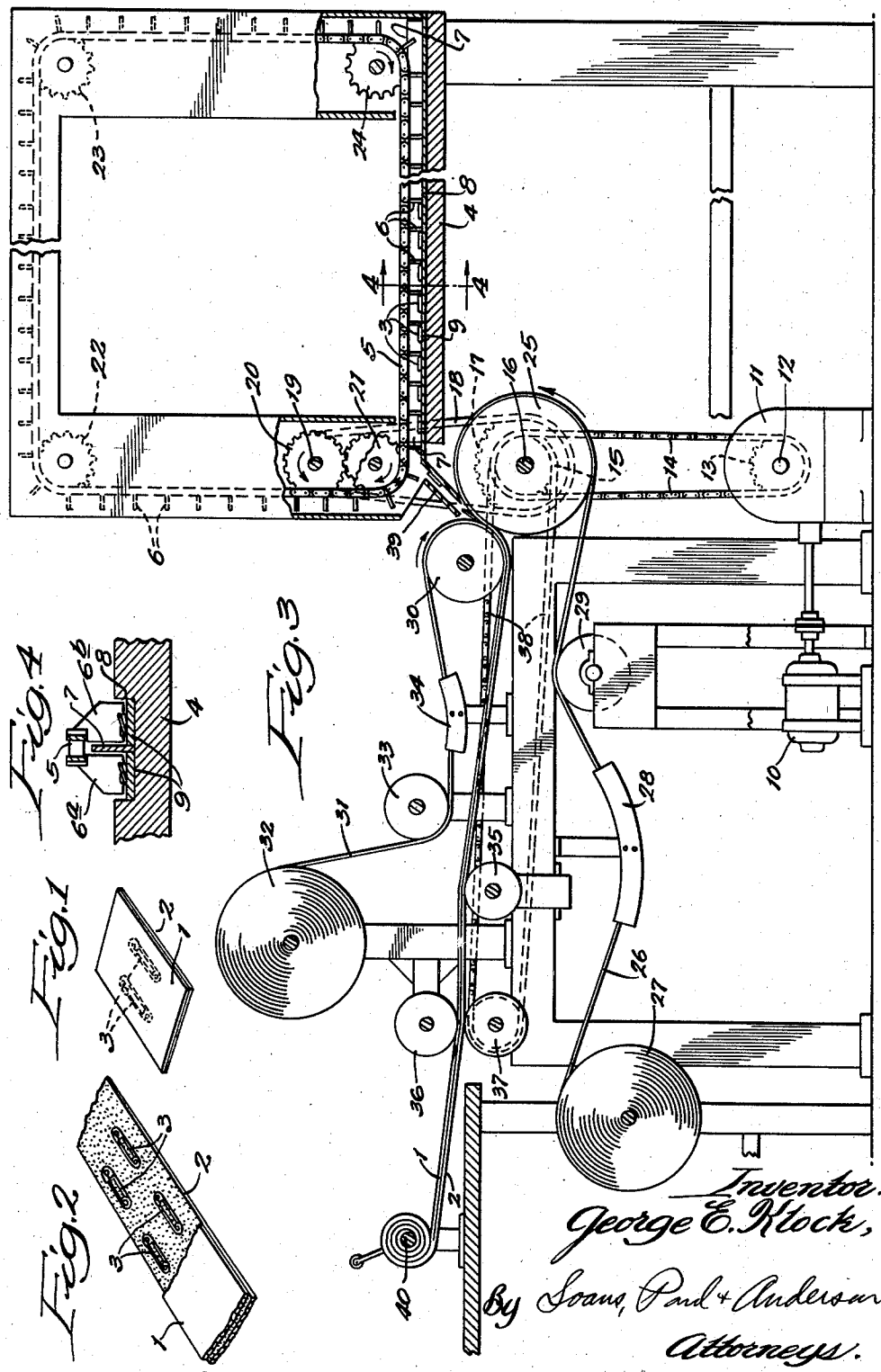

Fig. 4

Fig. 1

Fig. 2

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APPARATUS FOR PACKAGING SAFETY PINS

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This invention relates to a safety pin package, a method and apparatus for making the same, and the principal objects of the invention are to provide a very inexpensive but secure package for a limited and predetermined number of safety pins; to provide a method by which the improved package may be rapidly and economically made; and to provide apparatus for automatically producing the package at a high rate of speed. Another object is to provide a machine of the character indicated which will be dependable in operation and will require but little, if any, attention by an operator.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing (one sheet) wherein there is illustrated a package embodying a selected form of the invention together with the method and a selected apparatus for practicing the method and making the package.

In the drawing,

Fig. 1 is a perspective illustrating one form of package embodying the invention;

Fig. 2 is a perspective illustrating a strip produced by the method and apparatus about to be described, and from which strip, packages such as shown in Fig. 1 are cut;

Fig. 3 is a side elevation of apparatus for practicing the method and producing the improved package, certain portions being broken away and shown in section to better illustrate the construction, and

Fig. 4 is a section on the line 4—4 of Fig. 3.

The package embodies two paper or other sheet material plies 1 and 2 between which are located a pair of safety pins 3. One of the tape strips, such as the tape strip 2, may be made of adhesive tape; that is, tape having one face coated with glue which serves to adhesively unite the two plies with the safety pins therebetween.

A package such as above described may initially be formed in a long strip, such as shown in Fig. 2, from which predetermined lengths may be cut to form packages having two pins or any multiple thereof.

The apparatus for forming the packages comprises a table 4 above which there is mounted an endless conveyor 5 which carries a series of flights or pusher fingers 6 in regularly spaced relation, the spacing being sufficient to receive between the flights somewhat more than the length of the pins to be packaged. The conveyor 5 is mounted centrally of the table 4 so that portions of the table extend laterally from the opposite sides of the conveyor as best shown in Fig. 4.

The flights 6 are in pairs, each pair comprising members such as 6a and 6b respectively carried by the chain 5 and depending therefrom on opposite sides of a partition strip 7 which is suitably mounted on table 4. The flights 6a and 6b travel

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in a recessed channel 8 provided in the table 4, the bottom of said channel being lined with suitable anti-friction material, such as smooth metal plates 9—9. Pins may be delivered in pairs by pin-making machinery to the channel 8 on opposite sides of the partition 7 so as to be positioned in pairs in front of the succeeding pairs of flights 6 or pins may be deposited in bulk on the table 4 on opposite sides of the channel 8 and manually fed one by one into the spaces between the flights 6 on opposite sides of the partition 7.

The conveyor 5 is continuously driven by means of an electric motor 10 which drives a speed reducing unit 11 having an output shaft 12 to which there is secured a sprocket 13. A chain 14 engaging the sprocket 13 also engages a sprocket 15 on a suitably journalled shaft 16 which also carries a sprocket 17. A chain 18 transmits power from the sprocket 17 to a sprocket on a shaft 19 which carries a conveyor chain driving sprocket 20. The sprocket 20 engages one reach of the conveyor chain 5 near the corner sprocket 21 which cooperates with other sprockets 22, 23 and 24 to guide the conveyor chain in a continuous path of travel.

On the shaft 16 there is also mounted a roll 25, the roll being fast to the shaft 16 so as to be driven thereby.

A web of adhesive tape 26 is drawn from a supply roll 27 of such tape through a suitable guide 28 and over a wetting or glue applying roll 29 and thence around the roll 25 and between said roll and an overlying pressure or squeeze roll 30. Another web of suitable tape-like material 31 is drawn from a supply roll 32 under a guide roll 33 through a suitable guide member 34 and around the squeeze roll 30 so as to be squeezed into face to face engagement with the adhesive bearing surface of the tape strip 26. The two tape strips thus joined in face to face relation are carried forwardly over a suitably supported guide roll 35 and between upper and lower press rolls 36 and 37 respectively. The lower press roll 37 is continuously driven by means of a chain 38 which engages a sprocket carried by the driven shaft 16 and another suitable sprocket on the shaft of the roll 37.

Pairs of safety pins fed forward by the successive flights 6 on the conveyor chain 5 are fed into a suitable chute 39 which conducts or guides the successive pairs of pins into the nip of the converging tape strips 26 and 31 as shown in Fig. 3. The successive pairs of pins are, of course, delivered in timed relation to each other so that the pairs of pins will be spaced longitudinally from each other along the lengths of the tape strips to thereby produce the relationship illustrated in Fig. 2. The chute 39, or at least its top wall may advantageously be made of transparent material to facilitate inspection of the

operation of the apparatus although this is not essential.

The cooperating squeeze roll pairs may each have either one or both of the rolls made of sufficiently resilient material to permit the thickness of the safety pin to become embedded in the rolls during the passage thereof between the rolls to thereby insure the production of face to face contact between the adjacent surface areas of the tape strips around the safety pins. For some purposes, it is preferable that the upper pressure rolls **30** and **36** be made of resilient material while the lower rolls are made of relatively rigid material, the result being that the bottom surface of the finished package will be flat while the pins will cause a slight projection of the top surface of the package.

The laminated strip carrying the pairs of safety pins between the laminations may be passed from the pressure rolls **36** and **37** through any suitable cutting mechanism for cutting the tape strip into sections containing the desired number of pairs of safety pins as fast as the strip issues from the rolls **36** and **37**. However, in the present structure, the laminated pin carrying structure is illustrated as being guided to a manually operated reel **40** by means of which the laminated strip is rolled into a supply roll of suitable size for subsequent handling.

In the described arrangement the pins are successively deposited between separate tape strips which are adhesively united around the pins of each pair. The pins are thereby effectively held against shifting within the package. Instead of employing separate tape strips, the pins may be delivered between the folds of a longitudinally folded tape strip and suitable adhesive may be applied to one of the folds so that when the folds are pressed together, they will be adhesively united in their interengaging areas around the interposed pins. Other changes in the described arrangement may be made without departing from the invention.

I claim:

1. In apparatus for packaging safety pins, the combination of means for guiding a pair of tape strips into relatively superposed relation, means for successively feeding safety pins into relatively spaced positions between the tape strips, said feeding means comprising a guideway, and means movable in said guideway for advancing safety pins along said guideway, said movable means having a plurality of relatively spaced flights which are disposed in and moved along said guideway, said flights serving to provide pin conveying pockets respectively adapted to be supplied with a predetermined number of said pins to be successively delivered as units to said tape strips, one of said tape strips being provided with an adhesive coating for adhesively uniting said tape strips in face to face relation around the successively positioned pins.

2. In apparatus for making safety pin packages of the class described, the combination of means comprising cooperating pressure rolls for guiding a pair of tape strips into relatively superposed relation, means for successively feeding pairs of safety pins into relatively spaced relation between said tape strips in the nip of said cooperating pressure rolls, said feeding means comprising a guideway, and means movable in said guideway for advancing safety pins along said guideway, said movable means having a plurality of relatively spaced flights which are disposed in and moved along said guideway, said flights serving to provide pin conveying pockets respectively adapted to be supplied with pairs of said pins to be successively delivered as units to said tape strips, one of said tape strips being provided with an adhesive coating for adhesively uniting said tape strips around said pairs of pins.

3. In apparatus for making safety pin packages, the combination of means for guiding a pair of tape strips into face to face relation to form a laminated web, means for delivering pairs of safety pins into position between said strips and in spaced relation lengthwise thereof, said pin delivering means comprising a table having a channel therein, a partition strip extending lengthwise of said channel intermediate its sides so as to partition the same into a pair of relatively independent channels, an endless conveyor, pairs of transversely aligned flights carried by said conveyor and movable thereby longitudinally along said channel respectively on opposite sides of said partition, said flights being operative to propel pairs of pins in spaced relation along said channel and out of one end thereof, an inclined chute for receiving said pins from said end of said channel and slidably conveying said pins from said channel to one of said tape strips, one of said tape strips being guided past said chute so as to receive said pin pairs therefrom and being provided with an adhesive coating serving to unite said tape strips around said pairs of pins, thereby to form said strips into a laminated web having pairs of pins spaced longitudinally of the length of the web and between its plies.

4. In safety pin packaging apparatus, the combination of means for feeding a pair of tape strips longitudinally, a pair of cooperating rolls guiding said strips into mutually overlying relationship, the respective tape strips being disposed around a substantial portion of the surface of said rolls so as to line the entering bight side thereof, an inclined chute for slidably conveying safety pins successively into said strip lined bight, and means for delivering said pins successively to said chute at predetermined intervals to thereby space the delivery of said pins to said strip lined bight, the inclination of said chute serving to determine the force with which said safety pins are delivered to said bight.

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