APPARATUS AND METHOD OF MAKING CLOTHESPINS

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This invention relates to a method of apparatus for making clothespins and further relates to a clothespin made by the use of said method and apparatus.

One important object of the invention is to provide a novel method for the construction of clothespins whereby a spring wire clothespin may be provided with plastic gripping jaws.

A second important object of the invention is to provide a novel method whereby a gang of such clothespins may be formed at the same time and thereafter separated into single units.

A third important object of the invention is to provide a novel mold for such clothespins and having a cap member arranged to hold the wire portions of the clothespin in laterally spaced relation.

A fourth important object of the invention is to provide a novel mold whereby each end of a spring wire may be provided with a plastic gripping jaw.

A fifth important object of the invention is to provide a mold of this character which may be disassembled for removal from the plastic jaws.

A sixth important object of the invention is to provide means for separating the individual clothespins from a gang of such pins.

With the above and other objects in view, as will be hereinafter apparent, the invention consists in general of a novel method of forming clothespins of the character above described, a novel mold apparatus for carrying the method into execution and a novel article of manufacture in the shape of a clothespin, all being fully described and illustrated in the accompanying drawings, and particularly claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views and;

Fig. 1 is a section on the line 1—1 of Fig. 2.

Fig. 2 is a longitudinal median vertical section on the center line of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Fig. 5 is a vertical transverse section through the old parts, the spring wire frame and the molten plastic material.

Fig. 6 is a view taken transversely through a gang of the wire frames and illustrating the hardened plastic material in sections.

Fig. 7 is a view illustrating the step of separating the gang of pins into single units.

Fig. 8 is a side view of a completed pin as constructed in accordance with the method and in the apparatus forming features of this invention.

Fig. 9 is a view taken from the right side of Fig. 8.

In the accompanying drawings there is shown a mold cap indicated generally at 10, and shown in inverted position in Fig. 1 and in erect position in Fig. 5. This cap has a top member 11 and side walls 12. The inner surfaces of these side walls are provided with vertical grooves 13, the grooves in each wall being spaced laterally from each other and the grooves in one wall being opposite the grooves in the other wall. In connection with the capping member 10 there is provided a sectional mold bottom indicated in general at 14. This mold bottom includes a pair of mold sides 15 between which is fitted a mold bottom 16. This mold bottom has a groove 17 extending upwardly along the center line of the bottom and the rib is provided with a narrow edge portion 18. The upper part of the inner face of each wall 15 is cut away to provide an outwardly flaring portion 19, the lower edges of these flaring portions lying in the horizontal plane of the upper surface of the rib portion 18. Through the sides 15 and mold bottom 16 passes a bolt 20 having a head 21. On this bolt is fitted a swing nut 22, the head and wing nut bearing on the outer surfaces of the mold sides 15.

In the formation of the clothespin there is provided a length of wire bent at its middle portion to provide a substantially flat end 20. From the ends of this extends a pair of arms 21a. At the upper end of these arms the wire is bent to provide cross-members 22. From each of these extends a terminal portion 23, these being parallel upon insertion of the wire portion of the clothespin in the mold cap, so that the arms 21a lie in opposed grooves 12.

In use, a series of these wire forms is placed in the mold cap while the cap is in the inverted position shown in Figs. 1 and 2, the arrangement of the wires in the mold cap being also shown in Figs. 3 and 4. When all of the grooves of the mold cap have been filled, a supply of liquid plastic material such as is shown at 24 is provided in the mold bottom 14 between each wall 15 and rib 17, and its reduced portion 18, the plastic material filling the mold 14 to a level of the horizontal plane wherein lies the top surface of the reduced portion 18 and the lower edges of the cutaway portions 19.

The cap and the bottom part 14 are then set aside and left until the plastic material becomes hardened or set. When the plastic is set, the mold cap is removed, the nut 22 is then unscrewed from the bolt 20, the sides 15 separated laterally and the mold bottom 16 drawn out from between the plastic masses. This will leave two strips of plastic mass sections through which are shown in Fig. 6 at 23 and a number of the wire forms projecting upwardly therefrom as shown in Fig. 7. In order to separate the individual clothespins from these plastic strips we preferably provide a rapidly revolving shaft 24, on which is carried a series of spaced circular cutter blades 25 preferably serrated to form saws. The spacing of these cutter blades is identical with the spacing between the wire loops so that when the plastic masses 23 are brought into contact with these blades, such masses are cut to have parallel faces and form saws 25 of the proper shape to fit over a clothesline and grip the clothes thereon.

It will be obvious that in the practice of the present invention the arms 21a will be compressed in the act of inserting the wire formation into the mold cap 10 which not only places the wire formation under tension, but also serves to spread apart the terminal portions 23 of the formation. Thus, this procedure not only retains the wire formation in the mold cap, but also permits the plastic tips to be molded on the terminal portions 23, while the latter are under tension and in spaced apart relation whereby when the tips have set the completed clothespin acts in the nature of a spring clamp.

It is obvious that minor changes may be made in the form of construction of the apparatus and changes may also be made in the steps of the method without departing from the material principles involved. Furthermore, the precise form of the finished clothespin may be varied also without departing from the peculiar char-
acteristics thereof. It is not, therefore, desired to confine
the invention to the exact form herein shown and de-
scribed, but it is wished to include all such as properly
come within the scope claimed.
We claim:
1. A molding apparatus for forming plastic jaws on
the free ends of spring wire clips, each clip including
a pair of free clamping ends and an integral loop por-
tion connecting the ends and urging them relative to
each other, comprising an elongated mold having a bot-
tom wall, upstanding side walls and an open top, a longi-
tudinally extending rib upstanding centrally from the
bottom wall and dividing the mold into two separate
cavities, each of which is adapted to contain a separate
bath of liquid plastic material, said rib terminating in
a reduced upper end at the upper level of the baths, a
channel shaped holder including a pair of opposed side
walls and a wall connecting the side walls and adapted
to form a top wall for the mold, said side walls of the
holder seating on the upper ends of the side walls of
the mold, each side wall of the holder being formed with
longitudinally spaced transverse grooves, the grooves in
the walls being aligned transversely of the holder to
receive the sides of the loops of the clips and the grooves
in the walls being spaced apart transversely of the holder
to compress the loops slightly and spread the ends of
the clips apart, the ends of each clip extending from the
holder beyond the walls and being immersed in the sepa-
rate baths, said upper ends of the side walls of the mold
extending above the upper end of the rib and having
their inner surfaces concaved to receive the juncture
portions of the loop and clamping ends.
2. The method of forming plastic jaws on the free ends
of a spring wire clip, which includes a pair of free ends
and a loop connecting said ends and normally urging
them relative to each other; comprising the steps of pre-
paring separate side by side baths of liquid plastic ma-
terial, compressing the loop of the clip to spread the
ends apart, immersing the ends of the clip in the separate
baths while retaining them spread apart and allowing the
material to set.
3. The method of forming plastic jaws on the free
ends of spring wire clips, each of which includes a pair
of free clamping ends and a loop connecting the ends
and normally urging them relative to each other, compris-
ing the steps of preparing separate side by side baths
of liquid plastic material, assembling the clips in spaced
fashion in a row, compressing the loops of the clips to
spread the ends apart, immersing the ends of the clips
in the baths while retaining them spread apart with the
legs of each clip being in the separate baths, and allow-
ing the material to set.
4. In the method of claim 3, the further step of simul-
taneously severing the material between each clip.

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