Thus, it is an object of this invention to provide a non-fragile corrugated fastener stick for loading in a magazine fed driving tool.

Still another object of this invention is to provide a longer corrugated fastener stick than previously feasible.

Still another object of this invention is to provide a more conveniently handle stick of corrugated fasteners.

Another object of this invention is to provide a stick of corrugated fasteners not employing an adhesive.

A particular object of the invention is to employ a one-piece continuous strip folded into a stick suitable for insertion in the magazine of a driving gun.

These and still further objects and advantages of the present invention will, in part, be pointed out with particularity and in part, become obvious as the following description proceeds taken in conjunction with the accompanying drawings.

In the drawings:

FIG. 1 is a perspective view of a corrugated fastener being driven into a pair of wooden latches.

FIG. 2 is a top plan view of a fastener stick in expanded form.

FIG. 3 is a flow chart showing the manufacture of the fastener stick.

FIG. 4 is a flow chart showing a method for manufacturing an alternative embodiment.

FIG. 5 is an end view of an alternative embodiment of the invention.

FIG. 6 is a top plan view of a fastener stick showing another method of securing the stick against expansion.

FIG. 7 is a plan view of a section of a blank during the process of manufacture.

Referring now to FIG. 1, there is shown a fastener 11 about to be driven into workpieces 9a, 9b. It will be noted that the individual fastener 11 has been severed from the balance of a stick 12 of such fasteners by the driver blade 10 of the fastener driving machine. Each of the corrugated fastener elements 14 in the stick 12 is formed with a plurality of lateralmost points 13.

Whereas in the prior art, a plurality of individual corrugated fastener members are collared together by means of adhesive into a stick, in carrying out the present invention the corrugated fasteners are formed in the continuous member folded upon itself accordion-like, as shown (in expanded form) in FIG. 2, and comprising a plurality of corrugated fasteners 11a, 11b, 11c, etc. Since there is a natural tendency for the folded member to expand, as shown in FIG. 2, it is necessary to provide means to keep the stick firmly clamped together in a compact assembly. Several methods of accomplishing this will be discussed hereinafter.

The foremost fastener may contact its succeeding fastener in either the conventional nested relationship employed in adhesively secured sticks, or in the lateralmost point to lateralmost point relationship. If a nested arrangement is employed, it is preferred that the bending be carried out in such a way that the adjacent corrugated fasteners are separated slightly to permit the driver blade of the fastener driving machine to sever an individual fastener from the strip without interfering with the succeeding fastener.

The operation adapts itself to continuous production procedures.

Referring now to FIG. 3, there is shown such a procedure. At station "A," there is provided a supply spool 20 of steel 22, of suitable width and thickness, typically about 0.020" thick and about ¼" wide, the width being determined by the dimensions of the magazine of the particular gun for which the corrugated fastener is intended. As the material 22 is supplied from roll
20, it is fed to a punch press operation at station "B" where a conventional stamping die stamps out a portion leaving a tongue member 23 and a pair of tabs 24 and 25. The strip moves on the station "C" where an abrasive wheel 26 grinds a sharp edge 27. The strip then moves on to station "D" where corrugated rolls 28a and 28b corrugate the strip. For purposes of illustration, the drawings show the strip in an edge view at stations "D" and "E," i.e., rotated 90° from that shown at station "A"–"C." It is to be noted that the corrugating operation may also be carried out after the corrugating operation and it is often, for some applications, preferred, as this provides a many-toothed structure. It is not germane to the invention as to the particular order in which the grinding and corrugating is carried out. The strip then advances to station "E" where folding dies fold the strip, as shown. At station "F" a suitable die bends over tongue 23 to secure the stick against opening to the expanded position.

Again, for purposes of illustration only, an enlarged fragment of two adjacent fasteners are shown pictorially. The folding and bending dies are not shown since they form no part of this invention and their construction would be routine for a tool and die shop.

Still another method of carrying out the invention is shown in FIG. 4, where the corrugated strip 29 with a prescored edge (step "G") is folded (step "H") and passed through a pair of grind wheels 30 which grind a recess leaving tab portions 24 and 25. Corrugated and folded strip 29 is then tack welded, as by spot welder 31 (shown symbolically), to form a cohesive closely aligned stick 32. It is to be noted that the weld need be no stronger than that required to hold the fasteners together in a cohesive stick. In lieu of spot welding along the edges, the welding may be carried out on the top or bottom, for example, along lines A–A and B–B without departing from the spirit of the invention.

Since tabs 24 and 25 maintain the individual fasteners in the continuous strip, in lieu of welding, solder 34, for example, at the points shown in FIG. 6, can be used to prevent the stick from expanding. However, soldering by present day techniques is more expensive because of the need for prior removal of grease and oil accumulated during the forming procedures.

Another way of preventing the stick from expanding is to employ a pair of round, flat, or other shaped restraining wires 40 welded to the edges of the fasteners 11, as shown in FIG. 5. In use, the wires are fed out of the driving gun curling up adjacent to the gun for later disposition.

FIG. 7 shows a section of a steel strip 35 provided with simple rectangular cut-outs 36. The perforated strip is corrugated, ground, folded, and secured against expansion, as disclosed earlier.

Having disclosed the best embodiment of the invention presently contemplated, what is claimed is:

1. A corrugated fastener stick in the form of a continuous elongated member folded upon itself to provide a plurality of elongated elements having corrugations extending completely across their smaller dimension, said elements including top and bottom end surfaces and having opposed side edges, any two adjacent elements being integrally joined by relatively narrow U-shaped tab portions at one side edge and being free from connection at the other side edge, and tab portions being readily severable by an axial force applied to the top end surface of one of said adjacent elements, each of said elements having a series of relatively sharp penetrating points along the bottom end surface thereof, said member including frangible retaining means secured to the integrally joined side edges thereof, whereby said member is prevented from expanding.

2. The fastener stick of claim 1 wherein said frangible retaining means comprises an L-shaped tab clamping adjacent elements at said integrally joined side edges.

3. The fastener stick of claim 1 wherein said frangible retaining means comprises weld joints at said integrally joined side edges securing adjacent elements to each other.

4. A corrugated fastener stick in the form of a continuous elongated member folded upon itself to provide a plurality of elongated elements having corrugations extending completely across their smaller dimension, said elements including top and bottom end surfaces and having opposed side edges, any two adjacent elements being integrally joined by relatively narrow U-shaped tab portions at one side edge, said fastener stick further comprising a pair of wires secured to opposite sides of said folded member to integrally join any two adjacent elements along both side edges thereof, said wires being readily severable by an axial force applied to the top end surface of one of said adjacent elements, each of said elements having a series of relatively sharp penetrating points along the bottom end surface thereof.

5. The fastener stick of claim 4 including weld joints securing said pair of wires to said adjacent elements.

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