

United States Patent

Bolli

[15] 3,638,522

[45] Feb. 1, 1972

[54] CUTTING DEVICE WITH ZIGZAG KNIFE

[72] Inventor: **Hans-Ulrich Bolli**, Schaffhausen, Switzerland

[73] Assignee: **Schweizerische Industrie-Gesellschaft**, Neuhausen am Rheinfall, Switzerland

[22] Filed: **Apr. 30, 1970**

[21] Appl. No.: **33,229**

[30] Foreign Application Priority Data

May 6, 1969 Switzerland6924/69

[52] U.S. Cl.**83/345, 53/182, 83/333, 156/515**

[51] Int. Cl.**B26d 1/40**

[58] Field of Search83/171, 333, 679, 694, 922; 53/182

[56]

References Cited

UNITED STATES PATENTS

2,125,939	8/1938	MacFarren	83/674 X
2,803,100	8/1957	Aalseth	53/182
3,017,795	1/1962	Joa	83/333 X
3,244,049	4/1966	Smith et al.	83/674 X
3,522,689	8/1970	Wylie et al.	53/182
3,524,301	8/1970	Zimmerman	53/182

Primary Examiner—Andrew R. Juhasz

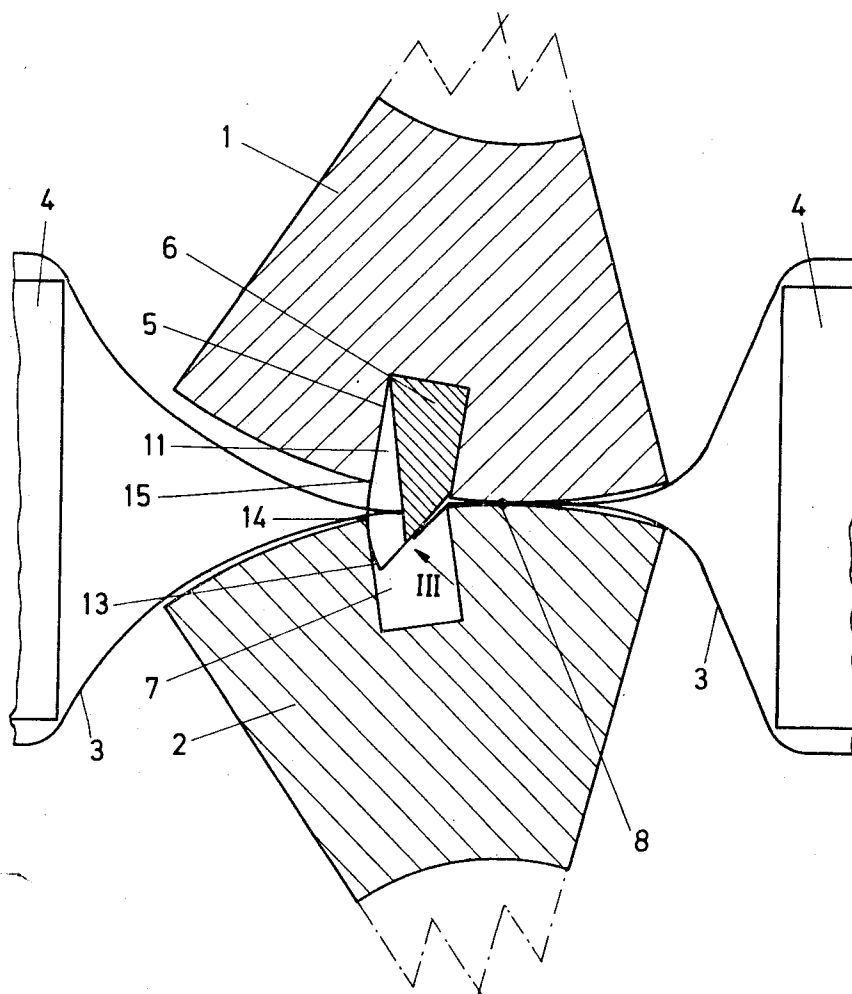
Attorney—Singer, Stern & Carlberg

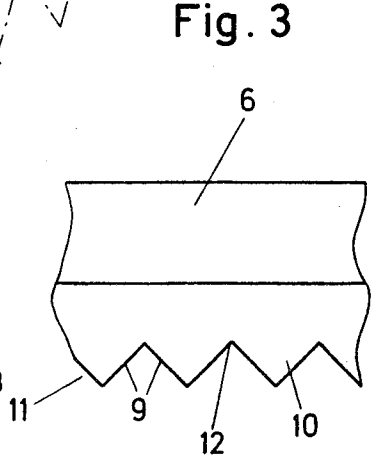
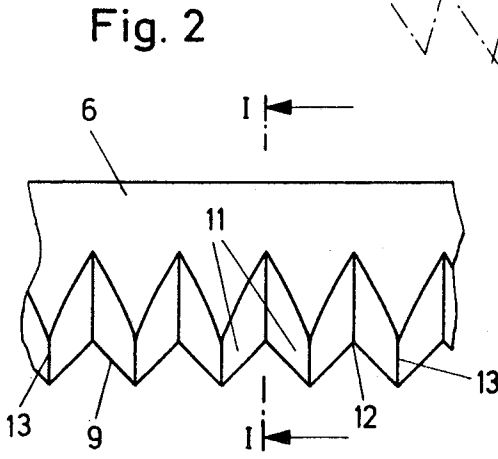
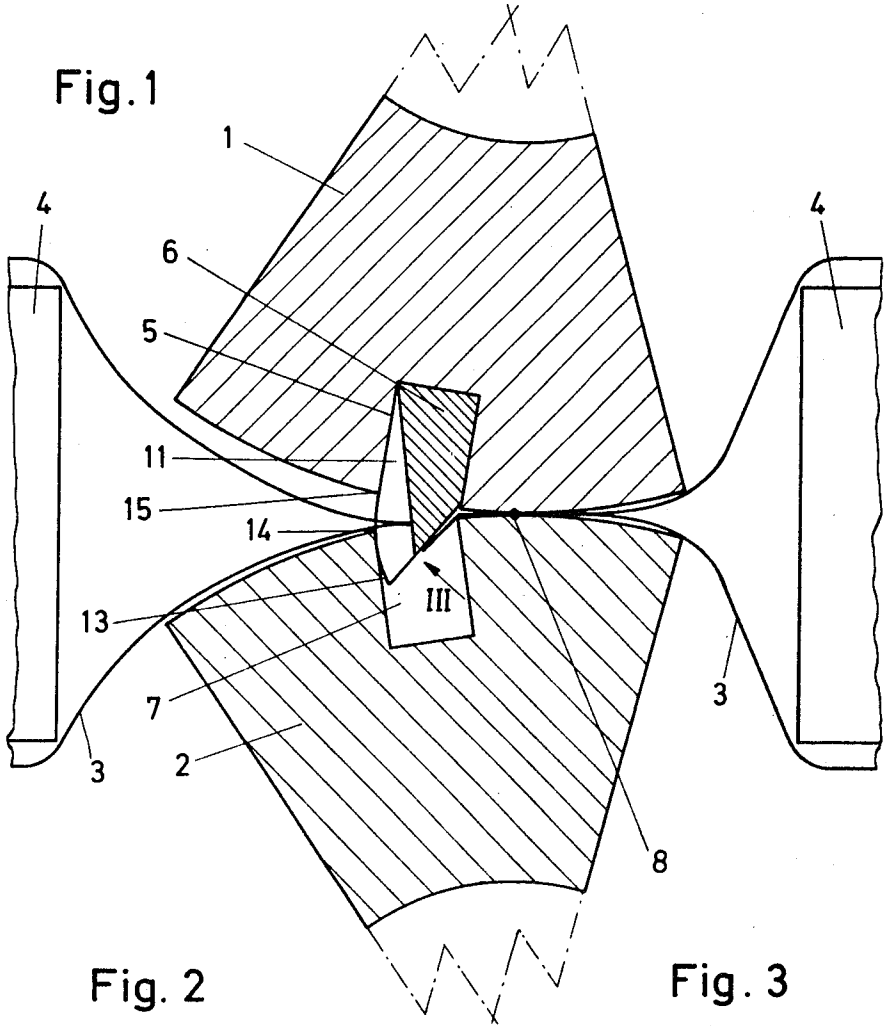
[57]

ABSTRACT

A cutting device comprising two oppositely rotating roller sectors of which one has attached thereto an axially extending knife with a zigzag-shaped cutting edge which during the rotation of the roller sectors enters an axially extending groove in the other roller sector so as to cut effectively through one or more layers of foil-shaped material which is clamped between the circumferences of said roller sectors.

1 Claims, 3 Drawing Figures





CUTTING DEVICE WITH ZIGZAG KNIFE

The invention relates to a cutting device with rotating zigzag knife, with two oppositely rotating roller sectors of which the one is fitted with the knife and the other has a groove, in which the knife enters upon the rotation of the sectors, whereby a web disposed between the sectors, and consisting of one or more layers of foil-shaped material, is successively cut in transverse direction. Known cutting devices of this type have the disadvantage, that they do not cut correctly certain webs, whose material is very thin and elastic. Such a web is not taken along by the knife in the groove and leaves the same uncut.

The cutting device of the present invention prevents this disadvantage and distinguishes itself by the fact that the zigzag-shaped cutting edge of the knife is formed by the free-lying edges of the end of teeth extending in transverse direction, said teeth being separated from one another by transverse grooves and having each a back, whose profile in transverse direction corresponds at least approximately to a cycloid, which upon rotation of the sectors moves closely along the rear outer edge of the mentioned groove.

In view thereof the web is held between this outer edge and the back of the teeth and is reliably intersected.

The drawing illustrates an embodiment of the invention by way of example.

In the drawing:

FIG. 1 shows a diagrammatic section of a cutting device, whereby the zigzag knife is sectioned along the line I—I of FIG. 2;

FIG. 2 is a plan view of the zigzag knife; and

FIG. 3 is a view of the knife in direction of the arrow III of FIG. 1.

Referring to the drawing, the cutting device comprises two oppositely rotating roller sectors 1 and 2 between which a wrapping tube 3 made of thin sealable or weldable foil and known in the trade under the mark "Cellophane" is pressed flat. The tube 3 contains already the articles 4 to be packed, for example, boxes or small stacks of tablets, in regularly mutual distances from each other and the tube 3 must now be cut between each two articles 4 and welded or fused together at the points of intersection. For the cutting of the tube 3, a knife 6 is fixed in an elongated groove 5 of the sector 1, and the portion of the knife 6 projecting from the groove 5 upon rotation of the sectors 1 and 2 enters into an elongated groove 7 of the sector 2 and thereby effects a cutting of the tube 3. For the welding of the tubular wrapper at the cut points, the two sectors 1 and 2, which for example are made of bronze, are heated by not illustrated electric heating elements which are embedded in the same, to the necessary welding temperature. In the area of the line 8, in which the sectors 1 and 2 press the tube 3 tight between them, first the rear end of the leading piece of the tube containing an article 4 is welded together and then the front end of the following piece of the tube.

Aside from the form of the zigzag knife 6 described later in greater detail, such a device is already known. The known device has, as already mentioned at the foregoing, the disadvantage

that depending on the quality of the tube material, the tube 3 is not always cut through. Particularly tubes made of very thin, elastic and tough material are simply drawn by the knife into the oppositely disposed groove and traveled with the knife itself through the groove, without performing a cutting operation. This can no longer occur in the device of the present invention on account of the particular shape of the illustrated zigzag knife 6.

The zigzag-shaped cutting edge of the knife 6 is formed by the free-lying edges 9 of triangularly shaped end surfaces 10 of adjacently disposed teeth 11 extending in transverse direction, which are separated from one another by corresponding transverse grooves 12. Each tooth 11 has a back 13 (FIGS. 1 and 2) lying in a transverse plane, whose profile corresponds at least approximately to a cycloid, which upon rotation of the sectors 1 and 2 moves along closely to the rear outer edge 14 of the groove 7. One may conceive that the cycloids 13 are so developed that the edge 14 first lies on the rear outer edge 15 of the groove 5 and that then the sector 2 is permitted to roll along the sector 1 assumed to be stationary. This construction of the knife has the result that if the pertaining piece of the tube 3 is grasped by the zigzag cutting edge, it will be held between the backs 13 of the teeth and the edge 14 and therefore cannot be drawn into the groove 7. Upon the further rotation of the sectors 1 and 2, or the knife 6, respectively, the latter must cut through the tube 3; which between the sectors 1 and 2 is formed by a web consisting of two layers of foil-shaped material.

It is obvious that the described cutting device is also adapted to the cut of a web consisting of a single layer of foil-shaped material, and that it is not at all necessary to perform a welding operation simultaneously with the cutting operation. It is also pointed out that the expression "sector" is to be understood in the most general sense, that is, also a full sector could be used with an angle at the center of 360°, although as a rule, solely roller sectors with a much smaller, particularly pointed angle at the center are employed.

The cutting operation can be still more improved by inserting into the groove 7 a profile piece, which enters between the individual backs of the knife 6.

What I claim is:

1. Cutting device comprising two oppositely rotating roller sectors of which the one is fitted with a knife and the other is provided with a groove in which the knife enters upon rotation of the sectors, whereby a web consisting of at least one layer of foil-shaped material disposed between said sectors is successively cut in transverse direction, wherein the improvement comprises that said knife is provided with a zigzag-shaped cutting edge formed by the free-lying edges of the end faces of teeth extending in transverse direction, said teeth being separated from one another by transverse grooves and have each a back whose profile in transverse direction corresponds at least approximately to a cycloid, which moves upon rotation of the sectors closely along the rear outer edge of said groove.

* * * * *

60

65

70

75