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R. McC. JOHNSTONE

2,205,564

ART OF SLITTING FLEXIBLE MATERIAL

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2 Sheets-Sheet 2

Fig. 3.

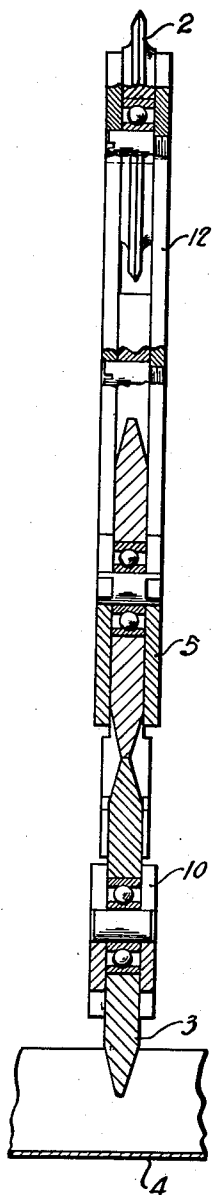


Fig. 4.

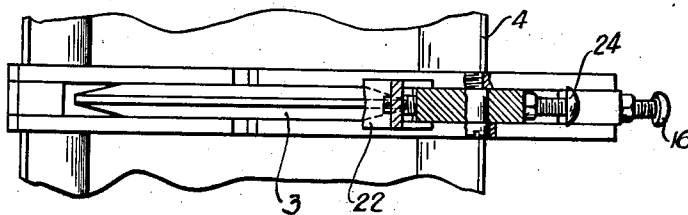


Fig. 5.

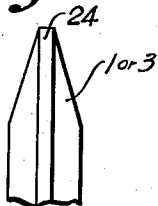


Fig. 6.

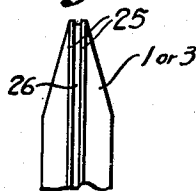


Fig. 7.

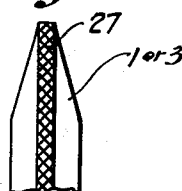


Fig. 8.

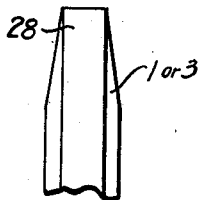


Fig. 9.

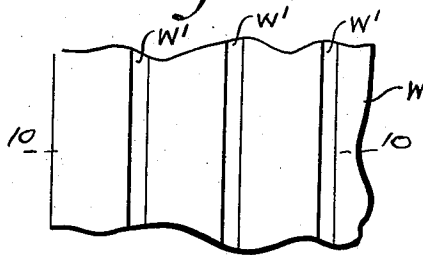


Fig. 10.



Fig. 11.



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ART OF SLITTING FLEXIBLE MATERIAL

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Application August 29, 1939, Serial No. 292,384

1 Claim. (Cl. 28—1)

This invention relates to the art of slitting flexible materials, and has for its main object and feature a method of and means for producing, from a web of flexible textile material, strips of material that have edges that are substantially non-raveling.

In the accompanying drawings the invention is disclosed in several concrete and preferred forms in which:

Fig. 1 is a top plan view of a carrier and associated elements that engage a platen roll;

Fig. 2 is a view partly in side elevation and partly in section of the carrier and elements shown in Fig. 1, with a part of the platen roll shown in section;

Fig. 3 is a vertical sectional view substantially on the plane of line 3—3 of Fig. 2, with the platen roll omitted;

Fig. 4 is a horizontal sectional view substantially on the plane of line 4—4 of Fig. 2;

Figs. 5, 6, 7 and 8 are detail views of various forms of rollers that can be used either as combined crushing and liquid-applying rollers or as fountain rollers;

Fig. 9 is a diagrammatic view of a web of flexible material having crushed and impregnated zones;

Fig. 10 is a transverse sectional view through the web substantially on the plane of line 10—10 of Fig. 9;

Fig. 11 is a transverse sectional view through one of the finished strips.

The instant method of producing, from a web of flexible material, strips of material that have edges that are substantially non-raveling consists essentially in subjecting the web, in the presence of an impregnating liquid, to pressure, along a plurality of lines, that crushes and permanently deforms the fibers of the web in the zones where the pressure is applied, and then slitting the web in said zones. The impregnating liquid can be applied to the web before the crushing action takes place but, in the present instance, it is applied simultaneously with the crushing action.

Web W of flexible textile material is received from any suitable source such as a roll from which it is unwound and passes over the surface of a rotatable platen roll P where it is acted upon and slitted in a manner presently to be described after which the slitted strips will be rewound in a manner well understood.

Engaging the material as it passes in contact with the platen roll are two members, one a combined pressure and liquid-applying roller 1

and a slitting element 2. 3 indicates a fountain or supply roller to supply impregnating liquid from fountain 4 to roller 1. The character of the impregnating fluid will depend upon the character of the material of the web to be treated and may range all the way from plain water to viscous and sticky material.

The function of roller 1 is to crush and permanently deform the fibers of the material passing in contact with the surface of the platen roll and simultaneously therewith to impregnate the crushed portions of said material with a sealing fluid. It will be understood that the web material can be subjected to crushing pressure in the presence of the impregnating liquid along a number of lines depending upon the number of appliances associated with the platen roll, and the number of strips desired. In Figs. 9 and 10 is shown a portion of web W with the crushed and impregnated zones indicated at W1.

The function of slitters 2 (of which only one is shown) is to slit the web in the crushed and impregnated zones to thereby produce a number of slitted sections, one of which is indicated at S in Fig. 11. As there shown, said strip is provided with edges S1, the fibers of which are crushed and sealed with impregnating fluid.

Members 1, 2 and 3 are supported on carrying means which in the present instance take the following form: 5 indicates a lever pivotally supported at 5a on rail 6. 7 indicates a bracket rigidly secured to lever 5 by rivets 8, and on this bracket is pivotally supported at 9 a second lever 10. Also pivotally supported at 11 on said bracket is an auxiliary lever 12. Roller 1 is rotatably mounted in lever 5, roller 3 is rotatably mounted in lever 10 and slitter 2 is rotatably mounted in lever 12. Extending from lever 5 is a spring member 13 that engages fixed abutment member 14. Rail 6 can be raised or lowered by any suitable means such as eccentric 15 to thereby increase or decrease the tension of spring member 13 so as to press roller 1 into engagement with the material on platen roll P with more or less pressure, or to bring it entirely out of contact with said material. It will be apparent that the movement of lever 5 in response to the influence of eccentric 15 also causes a movement of bracket 7 and levers 10 and 12. It will be observed, however, that this movement does not control the pressure between rollers 1 and 3 or between slitter 2 and the material on the platen roll. To independently control the pressure between rollers 1 and 3, a screw 16 is provided in threaded engagement with bushing 17 on lever 10

and in abutting engagement with bracket 7. Manipulation of this screw will cause lever 10 to swing on its pivot 9. Similarly, bracket 7 carries a bushing 18 with which a screw 19 is in threaded engagement, which screw 19 controls the pressure of a spring 20 that bears against auxiliary lever 12 and, by the manipulation of which, said lever 12 will move on its pivot 11 so that the slitting pressure can be independently adjusted. If desired, the thickness of the film of liquid transferred from fountain 4 by means of roller 3 to roller 1, can be regulated by a doctor blade 22 pivotally supported at 23 on lever 5, and the contact of which blade with roller 3 can be varied by means of screw 24 in threaded engagement with an opening in bracket 7.

It will be apparent from the foregoing that, while each of the members 1, 2 and 3 can be independently regulated to suit various materials and working conditions, the assemblage as a unit can be lowered to permit threading of the material around the platen roll. Furthermore, a certain individual adjustment of parts 1, 2 and 3 having once been made, the assemblage can be lowered as a unit with respect to the platen roll and can then be repositioned as a unit to obtain the same individual adjustments without the necessity of individually adjusting each part again. This is of advantage when a new roll of web material is to be threaded through the machine.

Slitting element 2 is of the familiar score-cut type.

Rollers 1 and 3 can take many forms as shown in Figs. 5 to 8. In Fig. 5, contacting surface 24 is smooth-faced and relatively narrow. In Fig. 6, the contacting surface is composed of two narrow beads 25 separated by an intervening narrow groove 26. In Fig. 7, contacting surface 27 is knurled. In Fig. 8, contacting surface 28 is relatively wide and smooth-faced.

I claim:

A pressure-applying, liquid-applying and slitting mechanism for acting on flexible material that travels in contact with the surface of a platen roll, including: a pivotally supported and spring-pressed lever; a crushing and impregnating roller, to engage the material on the platen roll, rotatably carried by said lever; a second lever pivotally connected to the first lever; a supply roller, rotatably mounted in said second lever, to supply liquid to the crushing and impregnating roller; means to vary the pressure with which the supply roller engages the crushing and impregnating roller; an auxiliary lever pivotally connected to the first-mentioned lever; a slitting element to engage the material on the platen roll, rotatably mounted in the auxiliary lever; and adjustable means to exert a spring pressure against the auxiliary lever to thereby press the slitting element against the material on the platen roll with a pressure that is independent of that exerted by the crushing and liquid-applying roller against said material.

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