(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 193 221**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **86200132.8**

(22) Date of filing: **30.01.86**

(51) Int. Cl.⁴: **B 26 D 7/26**
//B65H18/10, B26D9/00

(30) Priority: **31.01.85 NL 8500267**

(43) Date of publication of application:
03.09.86 Bulletin 86/36

(84) Designated Contracting States:
BE DE FR GB NL SE

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(54) An apparatus for perforating and cutting web material.

(57) An apparatus for perforating and cutting web material, comprising a frame (1) on which is mounted a table top (3) which is discontinuous (11) and fitted at that location with one fixed (8) and one adjustable perforation unit (9). On the upper shaft of the perforation unit, outwardly of the perforation rollers (8, 9) there are provided arms (20, 21) the free ends of which are interconnected by means of a shaft (22) with a freely rotatable hold-down roller (23) mounted thereon, with a circular blade coacting (26) with said hold-down roller (23).

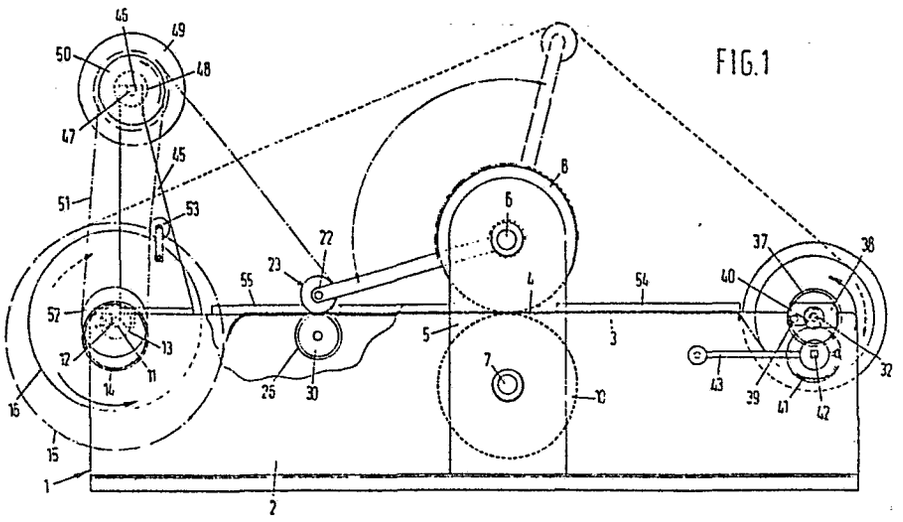

FIG.1

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Title: An apparatus for perforating and cutting web material.

The present invention relates to an apparatus for perforating and cutting web material.

It is an object of the present invention to provide a simple apparatus of the above type by means of which composite, web material can be rapidly cut to the desired width and be provided with a perforation.

To this effect the apparatus comprises a frame on which is mounted a table top at one end of which can be suspended a material supply roller, while at the other end can be attached a material discharge roller, between which rollers the table top is discontinuous and fitted at that location with one fixed and one adjustable perforation unit, while on the upper shaft of the perforation unit, outwardly of the perforation rollers, there are mounted arms the free ends of which are interconnected through a shaft with a freely rotatable hold-down roller mounted thereon, with a circular blade coacting with said hold-down roller. By driving the material discharge roller by means of a transmission, web material can be cut in a simple manner and subsequently be perforated.

Said circular blade may abut under spring pressure on the end of the hold-down roller. By dividing the hold-down

roller longitudinally into a plurality of portions or discs of differing lengths, the blade can be set in different positions in a simple manner.

In a further embodiment of the present invention, the blade may be disposed on a shaft provided underneath the table top and affixed to the frame, and the table top may be provided at that location with a slot extending parallel to said hold-down roller. The rotating blade can then coact with a counterblade affixed to a disc of the hold-down roller. In order to achieve a good support of the web material at the location of the slot, the blade may be attached at the side facing away from the spring to a disc coacting with the hold-down roller, preferably made of rubber, so that during operation, the web material is taken along without slip.

The rotating blade may freely abut on said counterblade under the influence of said spring pressure, which spring pressure is adjustable by means of an adjustable ring slidable along the shaft. There is thus obtained a very simple apparatus.

Furthermore, web guides may be provided on the table top both upstream and downstream, the web guides provided at the side of the adjustable perforation unit being adjustable as well.

In order to prevent a random discharge of the cut-off residual material, a drivable roller may be mounted adjacent the supply roller for taking up residual material

cut-off by the blade. Said roller is drivable through e.g. a chain drive by the supply roller driven itself by the web material.

The apparatus according to the present invention can also be used for rewinding material to smaller units: to this effect the arms with the hold-down roller attached thereto are mounted for swivelling movement through at least 90°.

One embodiment of the apparatus according to the present invention will now be described by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a diagrammatic side view of an apparatus for perforating and cutting material;

Fig. 2 is a top view of the apparatus shown in Fig. 1; and

Fig. 3 shows an enlarged detail of the apparatus shown in Figs. 1 and 2.

As shown in the drawings, an apparatus for perforating and cutting web material comprises a frame 1 with side cheeks 2 to which is attached a table top 3 having a slot 4 approximately in the middle. Adjacent said slot, the frame has supporting strips 5 rotatably supporting two shafts 6, 7. Shaft 6 supports a fixed perforation roller 8 and an adjustable perforation roller 9 slidable on shaft 6. Perforation rollers 8, 9 are adapted for coaction with the counter-roller 10 mounted on shaft 7 and an adjust-

able counter-roller, not shown.

At the left, cheeks 2 are fitted with recesses 11 adapted to receive a shaft 12 of an unwinding roller 13 adapted to receive a core 14 of a roll of material 15 supplied, called in short supply roller. In order to limit the movement of the supply roller or the core thereof on the unwinding roller 13, the latter is fitted with a fixed guide disc 16 and an adjustable guide disc 17, having a hub 18 which can be secured to the unwinding roller 13 by means of a socket screw 19.

Mounted on shaft 6, outwardly of the perforation rollers 8, 9 are arms 20, 21, the two free ends of which receive a shaft 22 on which is mounted a hold-down roller 23, consisting of a plurality of separate discs 24 of different widths. As shown in more detail in Fig. 3, there is mounted adjacent the hold-down roller 23 underneath the table top 3 a shaft 25 freely rotable in the cheeks 2 of the frame. On said shaft there is provided a rotating blade 26 adapted to coact with a counterblade 27, which is secured by means of a socket screw 56 on the shaft 22 of the hold-down roller 23. The rotating blade 26 is kept in contact with the counterblade 27 by means of a spring 28 and an adjustable ring 29. As shown in Fig. 3, a disc 30 of rubber or similar material abuts against the rotating blade 26. Naturally, the table top has a local discontinuity 31 for providing a good coaction between hold-down roller 23, and counterblade 27, respectively,

and the rotating blade 26 with the rubber disc 30.

At the end opposite the unwinding roller, the apparatus is provided with a take-up shaft 32, on which shaft are mounted two retaining plates 33, 34, at least the latter of which is adjustable. At the facing sides retaining plates 33, 34, are fitted with a cone 35, 36 for receiving a take-up core 37 shown in a chain-dotted line in Fig. 2. Shaft 32 is received in recesses (not shown) of the side cheeks 2 by means of retaining plates 38, which may be mounted for rotation on the cheeks 2, e.g. by means of pins 39, and be maintained in the retaining position by means of a spring, not shown, enabling an easy change of the tape-up core 37. Take-up shaft 32 has an outward extension. Mounted on the extended portion is a gear 40, arranged to cooperate with a gear 41 carried by a shaft 42 mounted on the frame underneath the take-up shaft 32. On the square end of the shaft 42 is mounted a hand grip 43 for rotating the take-up shaft 32.

The operation of the apparatus will be clear after the above description: After placing supply roller 15 on the unwinding core 13, the operator will pull off the web from it and pass the web manually underneath the rotating blade, between the perforation rollers and subsequently onto the take-up core. Thereafter the drive can be taken over by the hand grip 43.

In order to ensure a good guidance of the foil during its movement over the table top 3, this is fitted,

along a major portion of its length, with fixed guide strips 54 on one side and with adjustable guide strips 55 on the other side.

To avoid problems with respect to the strip discharged, the shaft 22 is extended outwardly and a plurality of discs 44 of different widths are disposed on said extended portion. The diameters of said discs correspond with those of the discs 24. On the frame are also mounted a pair of upwardly directed supports 45, the free ends of which have a recess 46 for receiving a shaft 47 on which is mounted a residue take-up core 48. For confining the residual material, there are provided on shaft 47 two guide discs 49, at least one of which is adjustable.

The drive of the residue take-up core takes place via a rope pulley 50 mounted on a projecting portion of shaft 47. A rope 51 running over the rope pulley 50 further engages a rope pulley 52 mounted on the unwinding shaft 12. Rope pulley 51 is kept under tension by means of a tensioning roller 53, which abuts against the rope pulley under spring tension in a manner well known, and hence not further described herein. For the purpose of a ready release of the rope pulley, the shaft 12 is received in the respective recesses of the frame by means of easily releasing retaining discs 54.

As best shown in Fig. 1, the hold-down roller 23 with the arms 21 can be swivelled upwardly into the position shown in chain-dotted lines. In that position,

a foil can be passed from a supply roller to a take-up core: in this manner it is possible with the apparatus to also distribute the foil of the supply roller in a simple manner over a plurality of take-up cores to be mounted successively on the take-up shaft.

It will be clear that a great many modifications are possible within the scope of the present invention.

CLAIMS

1. An apparatus for perforating and cutting web material, comprising a frame on which is mounted a table top at one end of which can be suspended a material supply roller, while at the other end can be attached a material discharge roller, between which rollers the table top is discontinuous and fitted at that location with one fixed and one adjustable perforation unit, while on the upper shaft of the perforation unit, outwardly of the perforation rollers, there are provided arms the free ends of which are interconnected by means of a shaft with a freely rotatable hold-down roller mounted thereon, with a circular blade coacting with said hold-down roller.

2. An apparatus according to claim 1, characterized in that the circular blade abuts under spring tension on the end of the hold-down roller.

3. An apparatus according to claim 1 or 2, characterized in that the hold-down roller is divided longitudinally into a plurality of portions (discs) of differing lengths.

4. An apparatus according to any one of the preceding claims, characterized in that the blade is disposed on a shaft underneath the table top and affixed to the frame, and the table top is provided at that location with a slot extending parallel to the said hold-down roller.

5. An apparatus according to claim 4, characterized in that the rotating blade coacts with a counterblade affixed to a disc of the hold-down roller.

6. An apparatus according to claims 4 and 5, characterized in that, at the side facing away from the spring, the blade is attached to a disc, preferably made of rubber, coacting with the hold-down roller.

7. An apparatus according to claim 5 or 6, characterized in that the rotating blade freely abuts against the counterblade under the influence of said spring pressure, which spring pressure is adjustable by means of an adjustable ring slidable along the shaft.

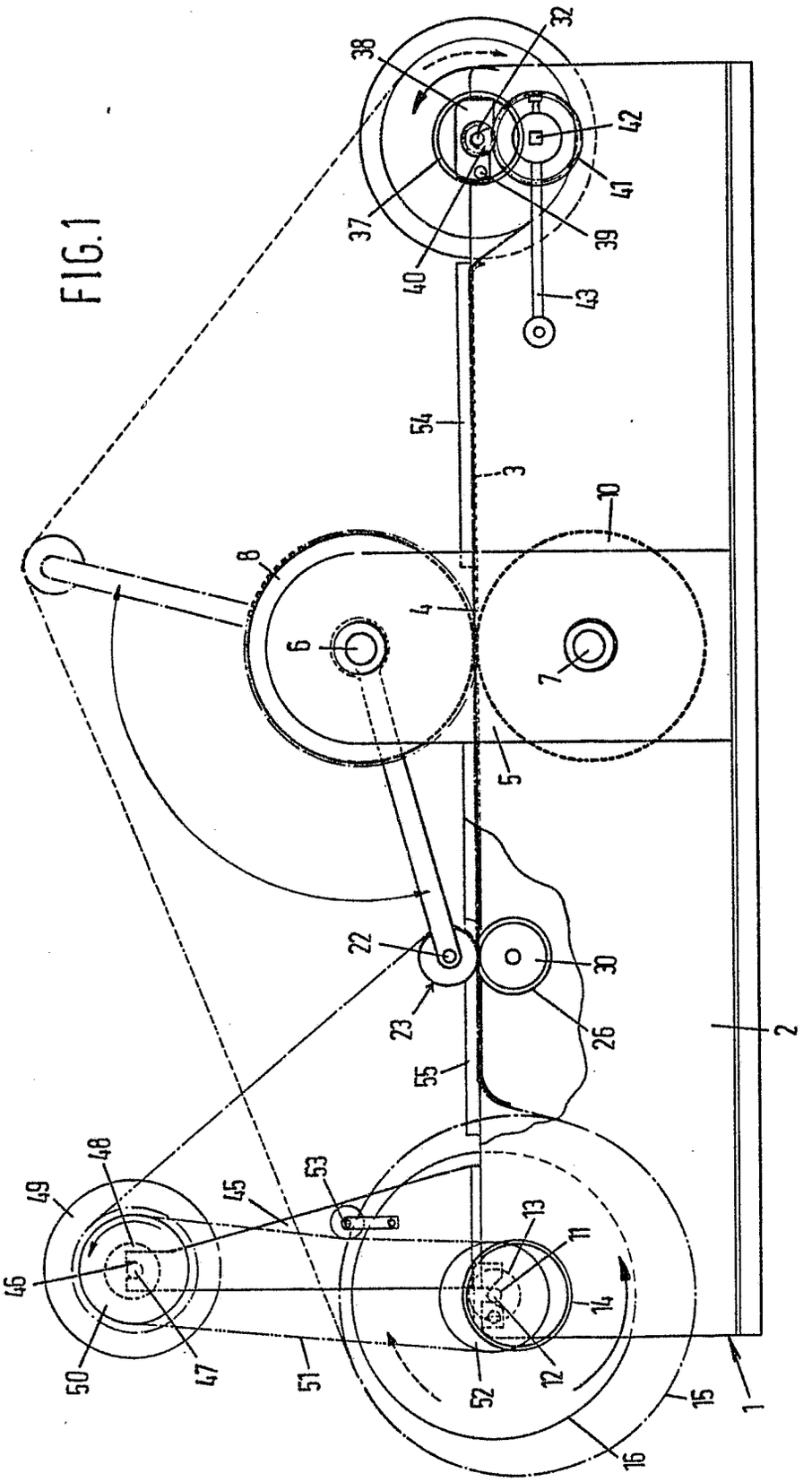
8. An apparatus according to any one of the preceding claims, characterized by guides disposed on the table top in upstream and/or downstream direction, with the web guides present on the side of the adjustable perforation unit being likewise adjustable.

9. An apparatus according to any one of the preceding claims, characterized in that adjacent the supply roller there is provided a drivable roller for taking up residual material cut by the blade.

10. An apparatus according to claim 9, characterized in that the roller for taking up residual material is driven through e.g. a chain drive by the supply roller driven itself by the web material.

11. An apparatus according to any one of the preceding claims, characterized in that the arms with the hold-down roller attached thereto can be swivelled through at least 90°.

FIG.1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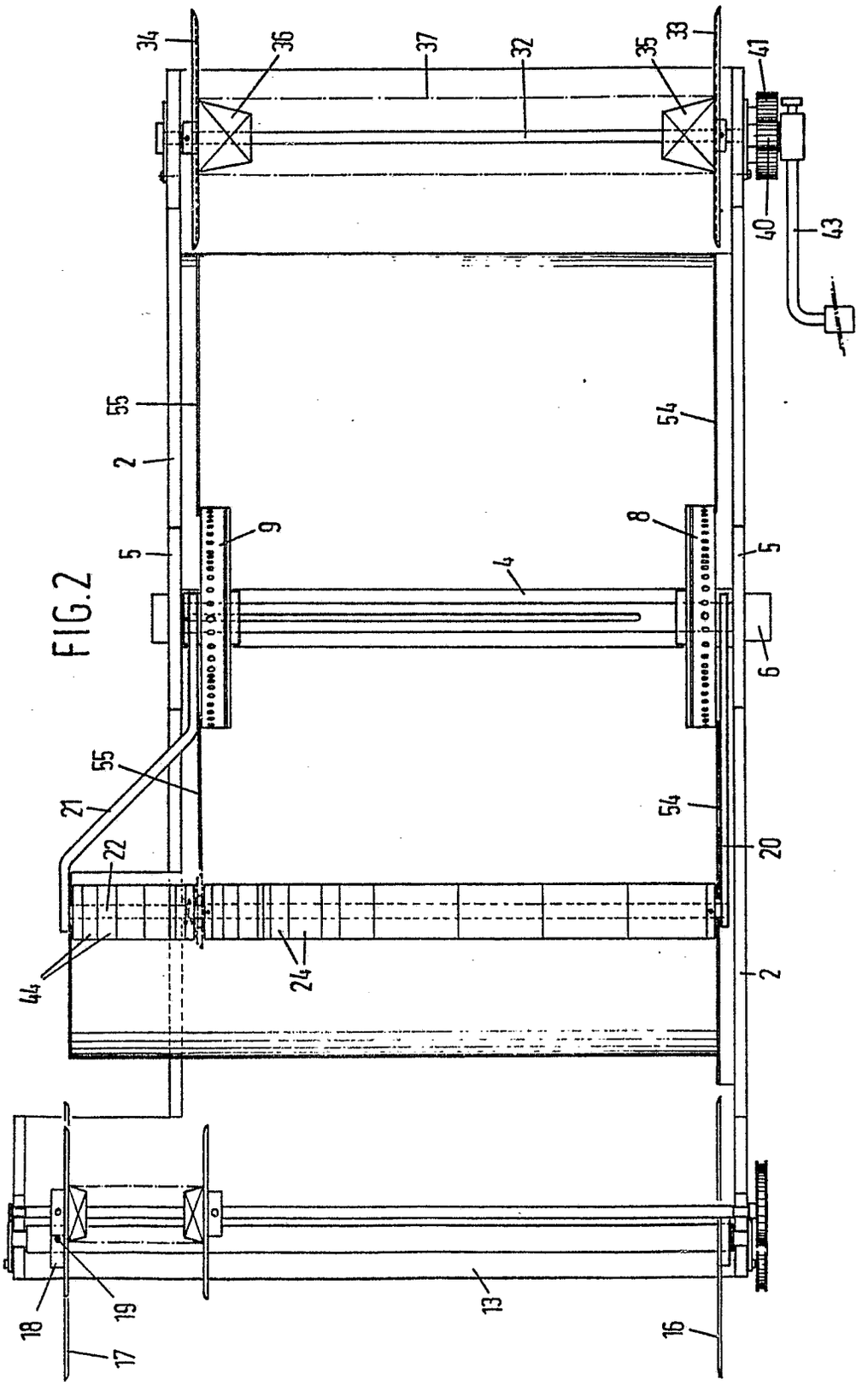
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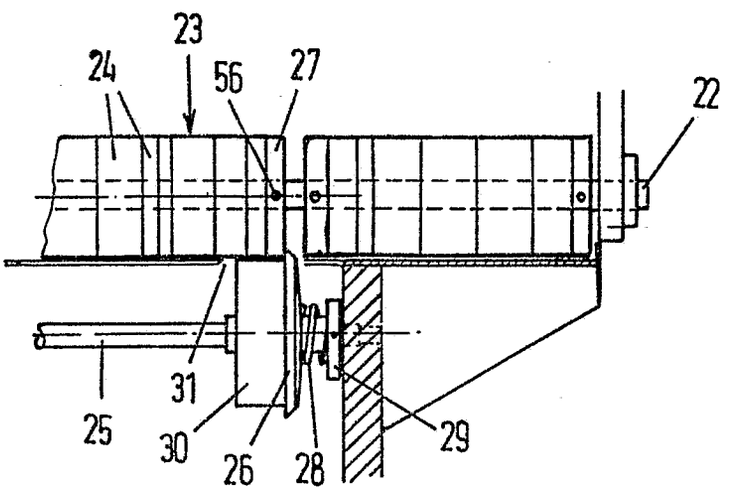
FIG.2

FIG.3



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EUROPEAN SEARCH REPORT

0193221
Application number

EP 86 20 0132

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	FR-A-2 392 917 (LES PERFORATEURS MECANOGRAPHIQUES) * Whole document *	1,8,9	B 26 D 7/26 // B 65 H 18/10 B 26 D 9/00
X	FR-A- 525 413 (CAMERON MACHINE CO.) * Whole document *	1-5,7	
A	NL-A-7 708 207 (MACHINES CHAMBON)		
A	GB-A-1 594 713 (TAI CHEONG)		TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	US-A-3 135 152 (BEDINGHAUS)		B 26 D B 65 H B 26 F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18-06-1986	BERGHMANS H.F.

CATEGORY OF CITED DOCUMENTS

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