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

(11) Publication number: **0 152 214**
A2

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **85300529.6**

(22) Date of filing: **25.01.85**

(51) Int. Cl.⁴: **B 26 D 7/18**

(30) Priority: **26.01.84 GB 8401994**

(43) Date of publication of application:
21.08.85 Bulletin 85/34

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

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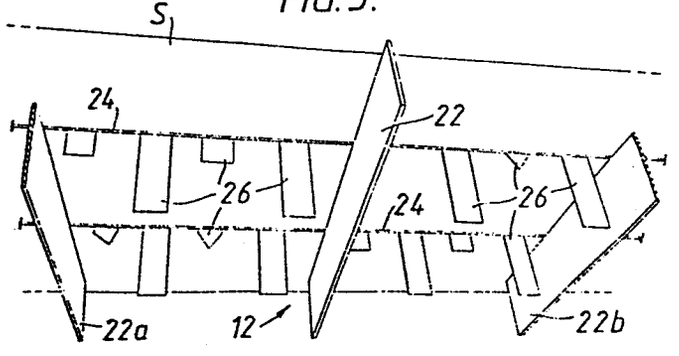
(54) **Blank separating device for die-cutting machines.**

(57) A blank separating device for a die-cutting machine comprises a static grid (12) located beneath the path of movement of a sheet (S) from which blanks are to be separated and a reciprocal pusher (10) located above the path of movement to push the sheet through the grid at predetermined intervals thereby to separate blanks from the sheet. The static grid comprises longitudinal blades (22) and transverse wires 24. Flat plates depending from the wires provide guide elements (22,26) to guide the separated blanks from the grid into stacks.

FIG. 3.



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BLANK SEPARATING DEVICE FOR DIE-CUTTING MACHINES

This invention relates to a blank separating device for a die cutting machine. The device is suitable for fitment into existing die-cutting machines thereby adding the capability to such a machine of separating individual blanks from a sheet without otherwise altering the die-cutter.

Die-cutting machines for producing carton blanks perform an ejecting function, that is, an operation whereby article receiving apertures, finger holes and other apertures are punched out of a die-cut blank, but relatively few die-cutting machines perform a scrapping operation that is, an operation whereby individual blanks are separated from a sheet passing through the machine, i,e nicks between adjacent blanks are broken and nicks between blanks and sheet margins are broken and margins removed.

In a conventional die-cutting machine ejection is performed in one section of the machine as well as the removal of three margins from the blank; 2 lateral margins and one rear margin.

The front margin and the blanks of each sheet remain connected together by nicks; the front margin continues to be gripped by clamps, mounted on flight bars that are connected to chains, which pull each sheet horizontally through the machine, from station-to-station.

The sheet (ejected and partly scrapped) is then pulled into further station of the machine where the front-margin can be

cut off and evacuated, and the blanks are then dropped onto a pallet, still connected by nicks.

Before shipping, blank separation has to be completed, which requires labour and various mechanical aids.

A die-cutting machine having an automatic scrapping facility is known in which the scrapping is performed by stamping the sheet between an upper die (embossed according to the shape of individual blanks) and a lower, static wire-grid through which the blanks are forced.

This saves manual scrapping, but the differences between the two types of machines are very considerable in terms of cost, and significance in terms of space (length of machine).

The stamping action of a blank-separating device according to the present invention is initiated by a signal from a cam mounted on the main shaft of the die-cutter, ensuring that the reciprocal movement takes place exactly when the sheet is in position above the static grid. The device is thereby synchronised with the die cutter.

However, prompted by this signal, the device is driven by its own pneumatic system, so that the speed and power of the stamping action can be set independently, so long as the number of reciprocal strokes follows the pace of the die-cutter, and remains constant, even if the die-cutting machine slows down.

The device can be fitted onto existing die-cutting machines, adding the capability to separate blanks (and thereby eliminating costly manual scrapping) without otherwise altering the die-cutter.

The device fits into a conventional die-cutter, and the resulting combination is a shorter machine than a machine incorporating an integrated blank-separation, and reduced cost.

Since the device is actuated independently, by its own pneumatic system, it can be finely adjusted and function optimally under all circumstances irrespective of the speed of the die-cutting machine.

This invention provides a blank separating device for a die-cutting machine which device comprises a static grid for location beneath the path of movement of a sheet from which blanks are to be separated and pusher means for location above said path of movement to push the sheet through the grid at predetermined intervals thereby to separate blanks from the sheet, characterised in that the static grid comprises downwardly extending guide elements to guide the separated blanks from the grid into stacks.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

FIGURE 1 is a schematic view of a blank separating device according to the invention in which pusher bars, are shown, in raised position;

FIGURE 2 shows the pusher bars in a lowered position having forced a sheet through a static grid, and

FIGURES 3 and 4 are perspective views showing the grid from below and on which a sheet rests.

Referring to FIGURES 1 to 4 of the drawings, the device comprises a reciprocal pusher 10 and a static grid 12. The reciprocal pusher 10 is mounted above the path of movement of a sheet 's' of carton blanks to be separated and comprises a pair of spaced parallel bars 14,16 which are vertically reciprocated by means of pneumatic plungers 18,20 respectively.

The static grid 12 is located below the path of movement of

the sheet 's' of blanks to be separated and comprises a longitudinal downwardly extending central blade 22, longitudinal side blades 22a and 22b and a plurality of transversely spaced wires 24. The blade and wires are spaced according to the lines of separation between the blanks. The parallel pusher bars 14,16 are positioned so as to straddle the central blade 22 of the grid. A series of spaced flat strips 26 hand downwardly from each of the static wires 24. The central and side longitudinal blades 22 and the wires cut the sheet in predetermined locations to separate individual blanks from one another as the reciprocal bars stamp downwardly to push the sheet through the static grid. The longitudinal blades and flat strips together provide guide elements to guide the separated blanks downwardly so that they do not overlap one another during stacking, the longitudinal blades providing a longitudinal guide and the flat strips providing transverse guides.

The stamping action of the blank-separating device is initiated by a signal from a cam mounted on the main shaft of the die-cutter, ensuring that the reciprocal movement takes place exactly when the sheet is in position above the static grid. The device is thereby synchronised with the die-cutter.

However, prompted by this signal, the device is driven by its own pneumatic system, so that the speed and power of the stamping device can be set independently, so long as the number of reciprocal strokes follows the pace of the die-cutter, and remains constant, even if the die-cutting machine slows down.

The device can be fitted onto existing die-cutting machines, adding the capability to such machines of separating carton blanks (and thereby eliminating costly manual scrapping) without otherwise altering the die-cutter.

The device fits into a conventional die-cutter, and the resulting combination is a shorter machine than a machine in-

corporating an integrated blank-separation, and reduced cost.

Since the device is actuated independently, by its own pneumatic system, it can be finely adjusted and function optimally under all circumstances irrespective of the speed of the die-cutting machine.

CLAIMS

1. A blank separating device for a die-cutting machine which device comprises a static grid (12) for location beneath the path of movement of a sheet (S) from which blanks are to be separated and pusher means (10) for location above said path of movement to push the sheet through the grid at predetermined intervals thereby to separate blanks from the sheet, characterised in that the static grid comprises downwardly extending guide elements (22,26) to guide the separated blanks from the grid into stacks.

2. A blank separating device according to claim 1, further characterised in that said grid comprises longitudinal blades (22,22a,22b) and a plurality of transverse wires (24) said guide elements being carried by said transverse wires.

3. A blank separating device according to claim 2, further characterised in that said grid comprises a central longitudinal blade 922) and a pair of longitudinal side blades (22a, 22b) defining opposed sides of said grid.

4. A blank separating device according to claim 2 or claim 3, further characterised in that said guide elements comprise flat plates (26) suspended at spaced locations from each of said transverse wires.

5. A blank separating device according to claim 3, further characterised in that said pusher means comprises a pair of reciprocal bars (14,16) positioned so as to straddle said central longitudinal bars and pneumatic plungers (18,20) to reciprocate said pusher bars.

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FIG. 1.

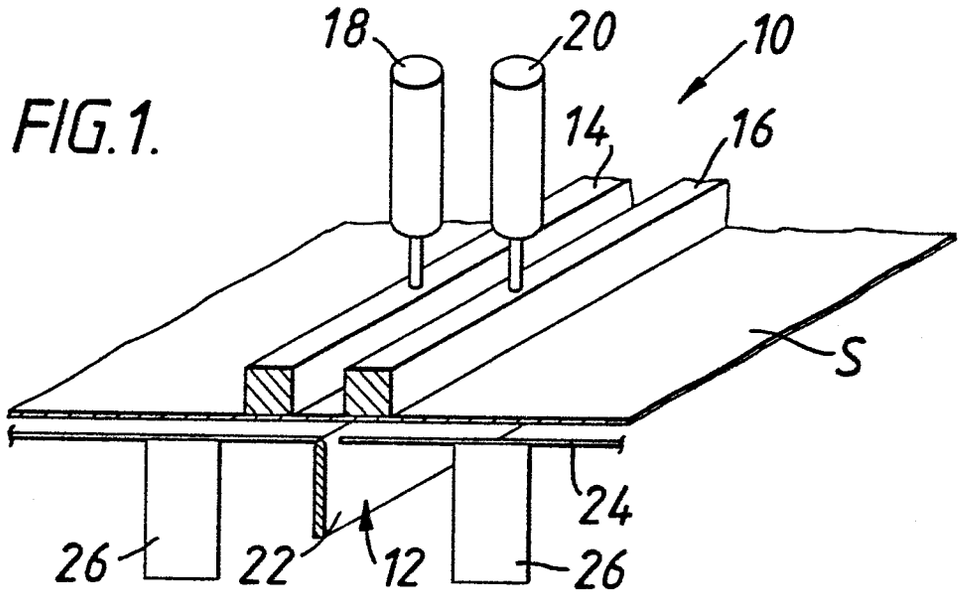

FIG. 2.

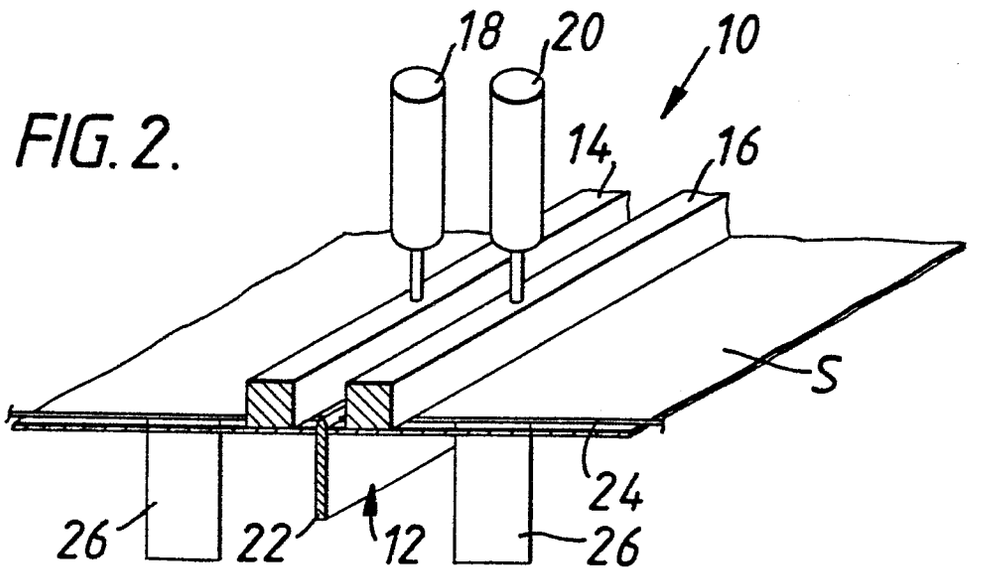

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FIG. 3.

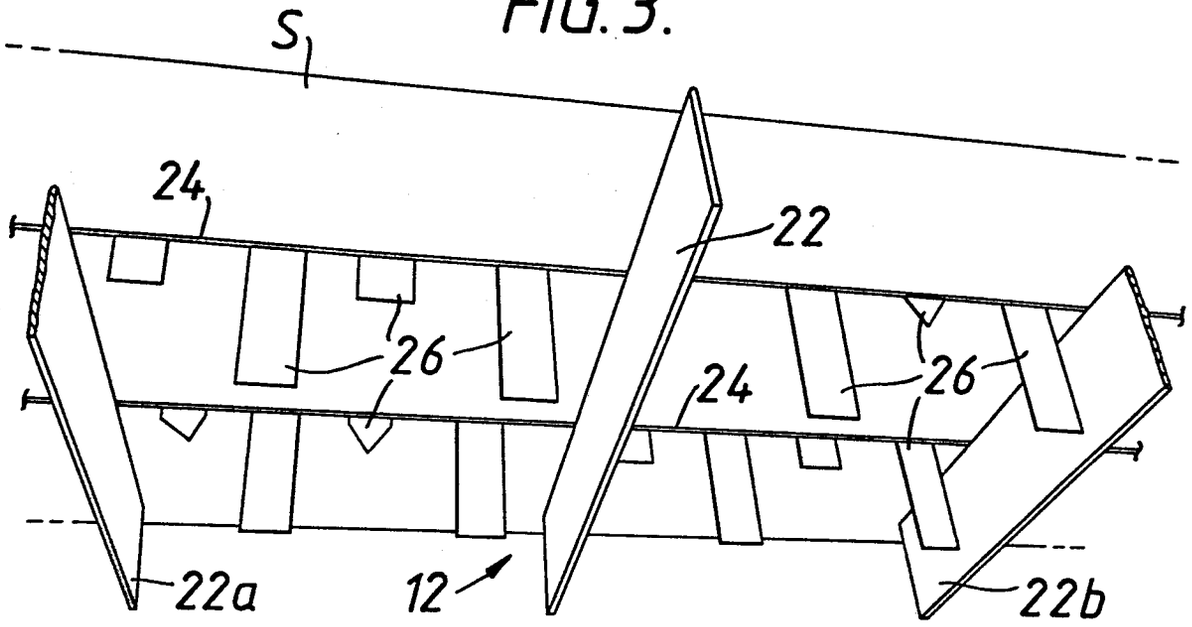

FIG. 4.