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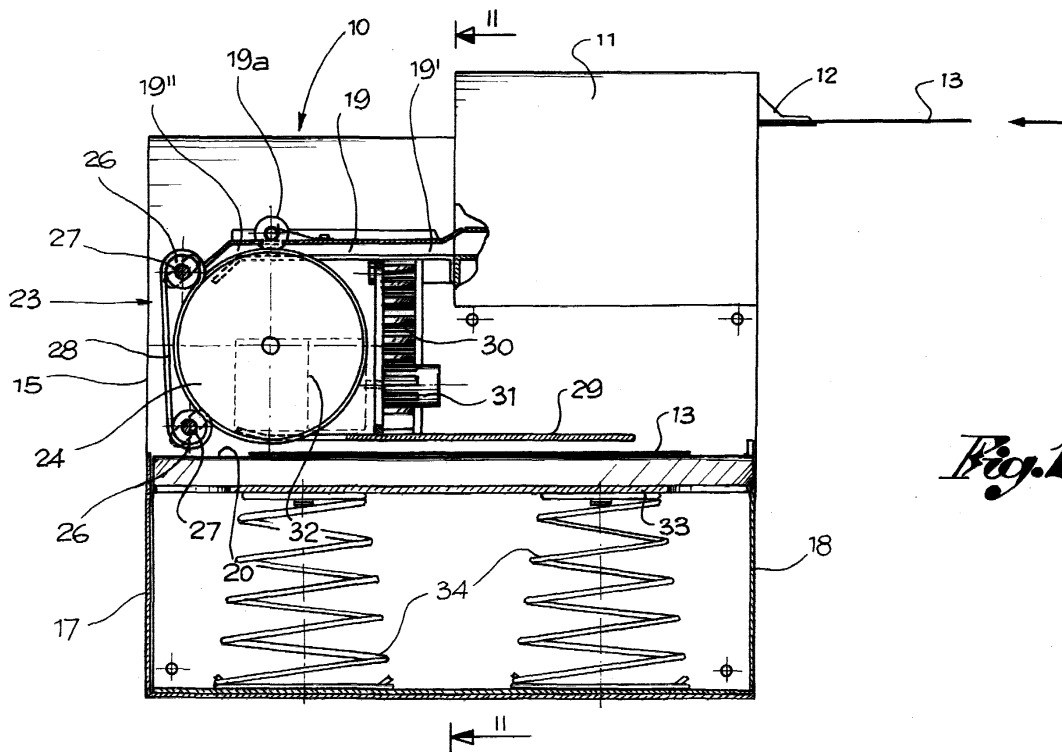
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(54) Stacking device for banknotes in automatic machines for payment of goods and services, with banknote identifier

(57) This invention concerns a stacking device for banknotes that can be applied to a banknote identifier, consisting of a body (15), a storage drawer (18), a channel (19) placed above the drawer and designed to receive each banknote recognised by the identifier, a support surface (20) placed between the receiving channel

(19) and the storage drawer (18), dragging devices (23) designed to move each banknote from the channel to the support surface, and a pusher (29) which moves perpendicularly to said support surface in order to transfer each banknote from the support surface to the storage drawer.



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Description

[0001] This device regards a device for receiving and stacking banknotes, with particular application to banknote identifiers in automatic machines for payment of goods and services.

[0002] There already exist stacking devices for banknotes that are able to receive, pile up and temporarily store banknotes of varying or equal sizes, or return them if the operation in progress is interrupted by the user or because the good or service in question is unavailable, or, alternatively, hold on to them if the operation is completed.

[0003] However, certain of the simpler applications only require the banknotes to be received, without any restitution function.

[0004] It is the aim of this invention to provide a stacking device for banknotes that can meet such requirements and which has, furthermore, a simple, economic structure which is also functional and reliable.

[0005] This aim is achieved by a stacking device for banknotes according to claim 1. It will be described here below in greater detail, making reference to the enclosed drawings, which are indicative but not binding, and where:

Fig. 1 shows the device in lengthwise cross-section, in combination with a banknote identifier and in the phase of receiving a first banknote;

Fig. 2 show a cross-section of the device at right angles, according to the arrows II-II in Fig. 1;

Fig. 3 shows a similar cross-section to that of Fig. 2, but with the device in the intermediate phase of storing the first banknote; and

Fig. 4 shows another cross-section of the device at right angles, in the final phase of stacking a banknote.

[0006] Fig. 1 shows the stacking device 10, together with a banknote identifier 11. The identifier 11 is already well-known and does not require particular attention here. However, it has a slot 12 for introducing the banknotes 13 and a final passage 14 for the banknotes to exit towards the stacking device 10.

[0007] This device 10 includes a body 15 with at least two side pieces 16 which are joined together and define, below, a chamber 17 in which there is located a storage drawer 18 for the banknotes 13. The chamber may have at the front and/or rear an access door for extracting the storage drawer.

[0008] In the top part of the body 15, there is a channel 19 for receiving and guiding each banknote 13 when it arrives from the identifier 11. The channel has an entrance 19' opposite the final passage 14 of the identifier, an exit 19" at the other end and, mid-way between the two, an idle roll 19a.

[0009] Above the storage drawer 18, that is, beneath the receiving channel 19, there is a support surface 20,

defined by two parallel longitudinal elements 21. These elements, between them, border a central opening 22 that enables each banknote to pass from the support surface 20 to the storage drawer 18.

[0010] At the exit 19" from the receiving channel 19, there are mounted two dragging devices 23 that accompany and transfer each banknote 13 from said channel to the support surface 20. For example, said dragging devices 23 may be formed by a guide pulley 24, driven to rotate by a small electric motor 25, by two rolls mounted on their respective axes 27 and carrying at least one belt 28, which comes into contact with the outer surface of the pulley 24. However, this does not exclude the use of alternative means of guiding.

[0011] In correspondence with the central opening 22 of the support surface 20 and parallel to this surface, there is mounted a pusher 29, in the form of a plate which is the right size to pass through said opening 22. The pusher 29 can move vertically - see Fig. 5 - between an upper position, in which it is above the support surface 20, and a lower position in the storage drawer 18, below the support surface. The movement of the presser can be obtained in various ways, preferably using a rack 30, fixed to the pusher and interlocking with a pinion 31 on the output shaft of a small electric motor 32.

[0012] Finally, in the storage drawer 18, there is a stacking plate 33 on top of springs 34, which can be compressed. Said plate 33 is moved downwards by the pusher 29 when the latter moves downwards; on the other side, the springs 34 move, while keeping the plate under upward pressure, in order to hold and block the banknotes below and against the longitudinal elements 21 of the support surface.

[0013] The device described above works as follows.

[0014] Normally, the pusher 29 is in the raised position, above the support surface 20. The device is activated with the arrival of a banknote 13, accepted by the identifier 11. The banknote passes into the receiving channel 19, is captured between the dragging devices 23, re-directed and transferred to the support surface 20, between this and the pusher 29. At this point, the dragging devices stop, while the pusher is activated and descends into the storage drawer 18 through the central opening 22 in the support surface. The movement of the pusher 29 then obliges the banknote to fold at the edges - Fig. 3 - so that it, too, can pass below the support surface 22 and come to rest on the stacking plate 33 in the storage drawer 18 - Fig. 4. Then, the pusher 29 goes back upwards and the stacking plate 33, pushed upwards by the respective springs 34, raises the banknote which is lying on it until it comes to rest under the support surface, where it is blocked.

[0015] In this way, the banknotes are progressively piled up on the storage plate and held in the storage drawer until the latter is opened to withdraw them.

Claims

1. Stacking device for banknotes that can be applied to a banknote identifier, **characterised by** a body (15), with a chamber (17) in the lower part, by a storage drawer (18) in said chamber, by a channel (19) located above said drawer and designed to receive each recognised banknote arriving from said identifier, by a support surface (20) placed between said receiving channel (19) and said storage drawer (18), by dragging devices (23) placed between the channel and the support surface which are designed to accompany and transfer each banknote from said channel onto said support surface, and by a pusher (29) that can move perpendicularly to said support surface and which is designed to move each banknote from above the support surface to below it, in the storage drawer (17).
2. Device according to claim 1, in which the storage drawer (17) is equipped with a stacking plate (33) pushed by at least one resistant spring up towards the underside of the support surface (20), said plate receiving the banknotes as they are transferred progressively by the pusher (29) to the storage drawer and blocking the piled up banknotes beneath the support surface.
3. Device according to claims 1 and 2, in which the support surface (20) has a central opening (22), and the pusher (29) is of the right size to pass through said central opening and is moved in a direction perpendicular to the support surface by a rack-pinion system.

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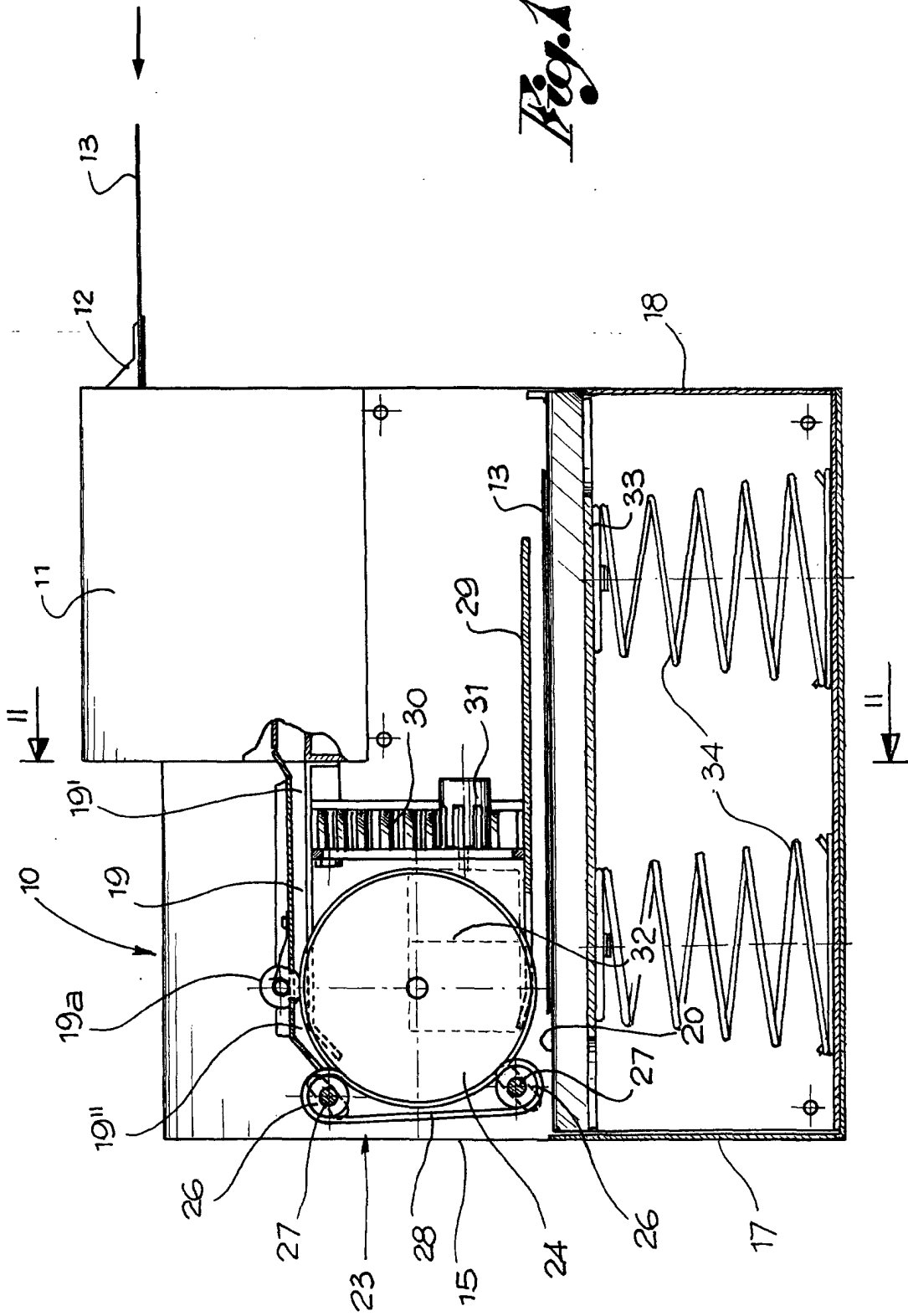
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Fig. 1



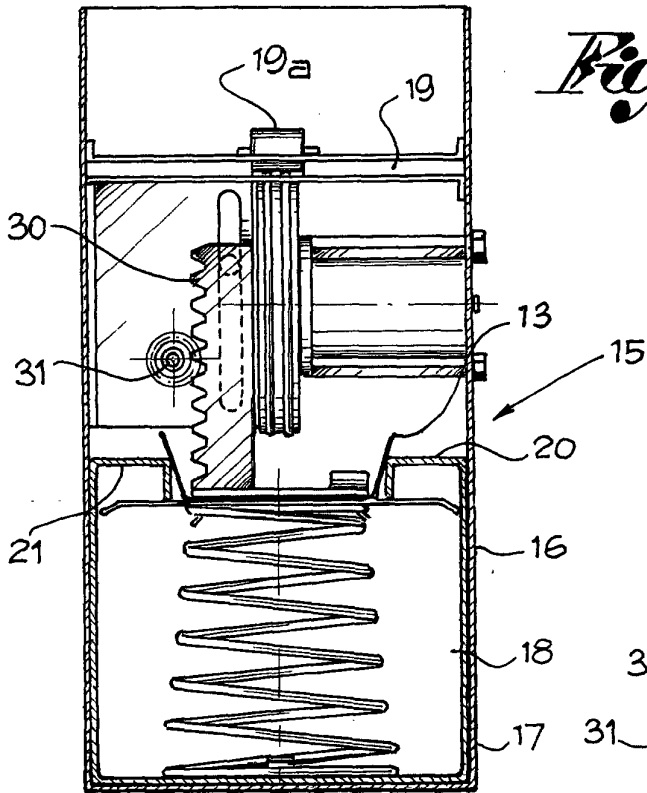


Fig. 3

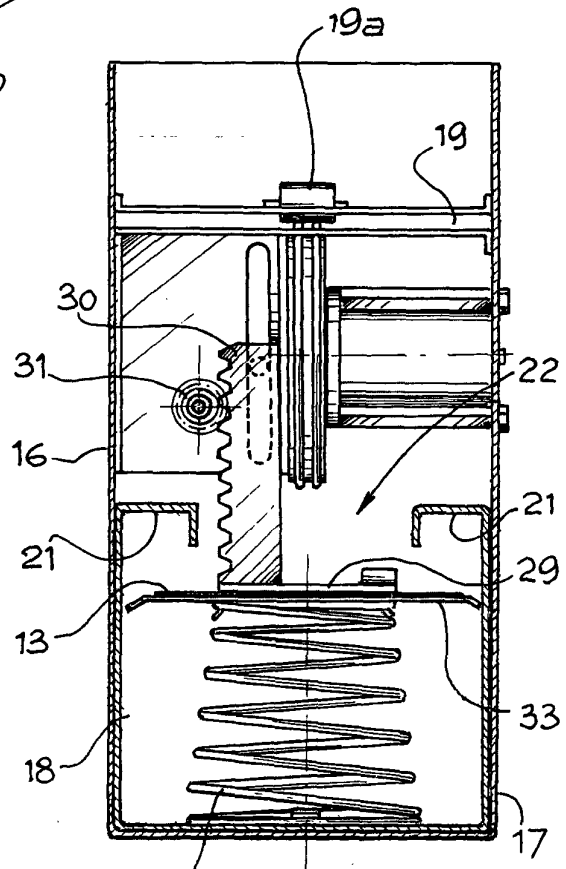


Fig. 4

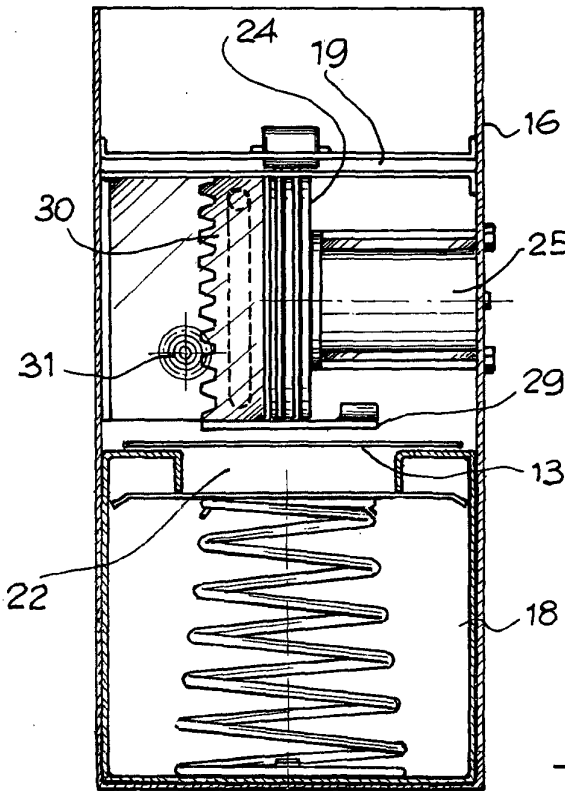


Fig. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 00 83 0389

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The present search report has been drawn up for all claims				
Place of search THE HAGUE		Date of completion of the search 7 November 2000	Examiner Van Dop, E	
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82