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

(11) Publication number: **0 265 996**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **87202012.8**

(51) Int. Cl.⁴: **E05G 7/00**

(22) Date of filing: **20.10.87**

(30) Priority: **25.10.86 GB 8625581**

(43) Date of publication of application:
04.05.88 Bulletin 88/18

(84) Designated Contracting States:
AT BE CH DE FR IT LI NL

(71) Applicant: **Chubb Lips Nederland BV**
Merwedestraat 48 P.O. Box 59
NL-3300 AB Dordrecht(NL)

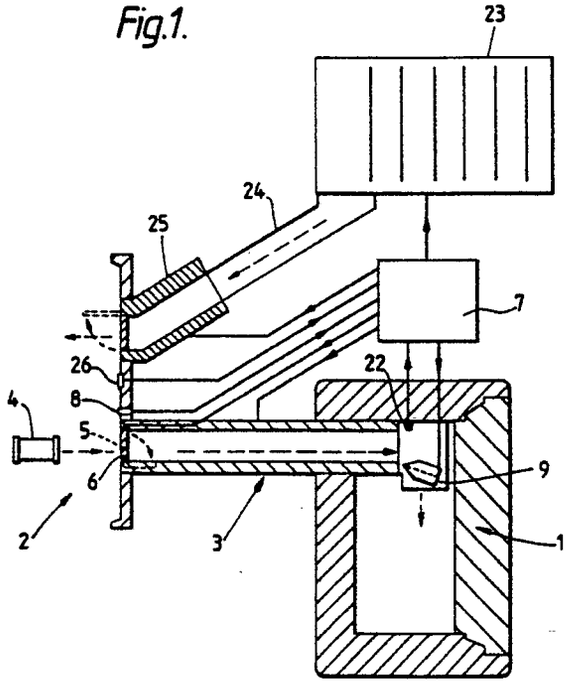
(72) Inventor: **De Vlaam, Petrus Dominicus**
Fortstraat 4
NL-4285 XZ Woudrichem(NL)
Inventor: **De Jong, Karel Marinus**
Vlasstraat 44
NL-3295 TN 's-Gravendeel(NL)
Inventor: **Gosens, Johannes Quirines Maria**
Kruithorn 23
NL-5126 WD Gilze(NL)

(74) Representative: **Obee, Robert William**
Racal Group Services Ltd. Group Legal Department Richmond Court 309 Fleet Road Fleet, Hants. GU13 8BU(GB)

(54) Security deposit apparatus.

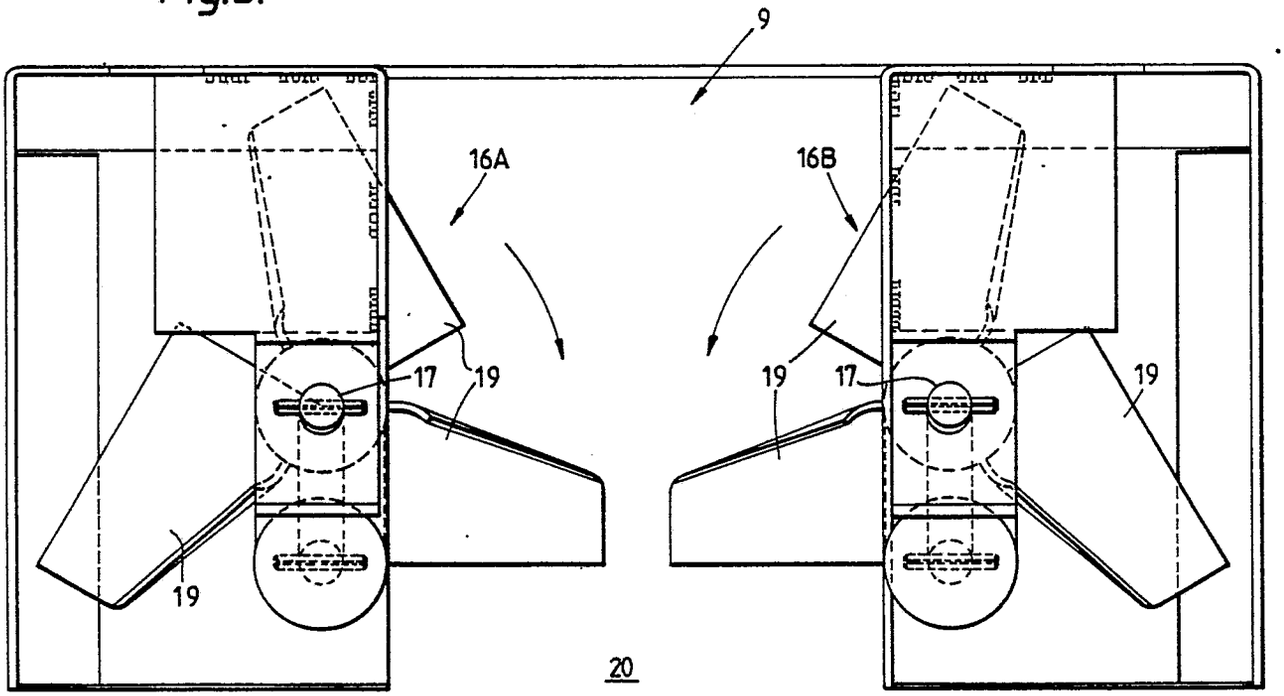
(57) An automated night deposit safe comprises a fascia unit 2 with an access opening 5 to receive money cassettes 4 which are conveyed by a transport unit 3 to the safe 1. The entrance to the safe 1 from the transport unit 3 is guarded by an "anti-fishing" device 9 which comprises a pair of parallel multi-vaned rotors 16A, 16B. The rotors can each rotate in one direction only, oppositely to one another, so as to pass the cassettes through the entrance 20 into the safe but to prevent cassettes from passing back in the reverse direction.

Fig.1.



EP 0 265 996 A1

Fig.5.



Security Deposit Apparatus

The present invention relates to security deposit apparatus and in particular is concerned with apparatus for use in the depositing of cassettes or other packages of money or valuables into a so-called night deposit safe in a bank or the like. Such apparatus conventionally comprises a station, accessible from the street, adapted to receive packages of a predetermined form for deposit; a security receptacle, located within the bank, for the storage of deposited packages; and means for the conveyance of such packages from the access station to the security receptacle.

One aim of the invention is to provide deposit apparatus of this kind with enhanced security against burglarious attempts to remove valuables stored in the security receptacle, presupposing that an attack might be mounted on the receptacle through the means provided at the access station for receiving packages for deposit.

Accordingly in one aspect the invention resides in security deposit apparatus comprising an access station adapted to receive packages of a predetermined form for deposit; a security receptacle for the storage of deposited packages; and means for the conveyance of such packages from the access station to the security receptacle; wherein the entrance to the security receptacle from the conveying means is proivded with a guard device adapted to permit the passage of such packages into the receptacle from the conveying means but to prevent the withdrawal of such packages through that entrance, which device comprises a pair of multi-vaned rotors disposed side-by-side on generally parallel axes, each said rotor being rotatable in one direction only and the directions of permitted rotation of the two rotors being opposite, whereby rotation of the two rotors in unison causes respective sets of their vanes to collectively define channels for passing individual said packages in one sense of direction only through said entrance.

In another aspect the invention resides in security deposit apparatus comprising an access station adapted to receive packages of a predetermined form for deposit; a security receptacle for the storage of deposited packages; and means for the conveyance of such packages from the access station to the security receptacle; wherein said conveying means comprises a driven belt against which such packages are pressed by a spring-biased bar such as to cause the packages to be driven along a track defined between said belt and bar, the bar being configured or borne such as to present a surface converging towards the belt so that as a leading package is driven along said track the bar is increasingly displaced away from the belt and thereby relieves the pressure of the bar acting upon a trailing package until the leading package is delivered to said guard device.

The nature of the invention will become more apparent from the following description of preferred embodiments thereof, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a schematic view of the major constituents of one embodiment of deposit apparatus in accordance with the invention;

Figures 2 and 3 are respectively schematic plan and elevation views of the transport unit used in the apparatus of Figure 1;

Figure 4 is a plan view of part of the transport unit;

Figure 5 is a front view of the "anti-fishing" device used in the deposit apparatus; and

Figure 6 is a vertical section through one of the rotors of the "anti-fishing" device.

Referring to Figure 1, the deposit apparatus comprises a safe 1 located within the building of a bank or similar institution, a fascia unit 2 located in the street wall of the building, and a transport unit 3 for conveying money cassettes 4 which are presented to the fascia unit, to the safe.

In operation of the apparatus a person wishing to deposit a cassette 4 presents it to the opening 5 in the fascia unit, which is normally blocked by a gate 6 at the entrance to the transport unit 3. Release of the gate 6 to allow the cassette to pass into the apparatus is under the control of a central control unit 7 and may be triggered by one of several means, such as the operation of a keyswitch or the presentation of a magnetically-encoded card to a reader located at the fascia unit. In the preferred illustrated embodiment, however, each cassette intended for use with this apparatus is equipped with a "hands-free" coded identification tag, of a kind as suggested in Dutch patent application No. 8204672, which is sensed by proximity to an antenna 8 located by the opening 5 and indicates the authenticity of the cassette together, perhaps, with an individual serial number of the cassette and/or the identity of the bank customer to which it was issued etc. When the conditions for deposit of a cassette have been recognised by the control unit 7 by any of the means indicated above the gate 6 is released and at the same time the transport unit 3 is activated to convey the inserted cassette rapidly into the building and deposit it onto an "anti-fishing" device 9 guarding the entrance to the safe 1.

As shown in Figures 2 and 3, the transport unit 3 comprises an electrically-driven belt conveyor 10 against which the cassette 4 is pressed sideways by a spring-biased bar 11 so as to be driven along the floor 12 of the unit to the device 9. The pulleys for the belt are equipped with non-return bearings which ensure that the belt can be moved in one direction only, thus resisting any attempts to withdraw a cassette once it has been inserted into the unit 3. An infra-red beam is shone along the unit 2 between a transmitter and receiver 13A, 13B to sense for any obstruction, and will inhibit release of the gate 6 if any blockage should have occurred as a result of previous use or mis-use of the apparatus. When the gate is released it is held released for a short period so that a user can place into the transport unit several cassettes in quick succession, which is desirable to ensure that the user is exposed to the risk of robbery for the shortest period during the deposit process. It is, however, desirable to introduce a short gap between successive cassettes reaching the device 9 to give the latter time to operate and to ensure that the leading cassette does not become jammed up against the end wall of the apparatus under pressure from cassette(s) behind it and therefore fails to fall into the safe 1; the spacing provided by this construction may also facilitate the identification of cassettes arriving at the device 9 by a second proximity antenna 22 as mentioned below. For these reasons the sidewall of the bar 11 may be tapered from front to rear as shown in Figure 4. The effect of this taper is that as the leading cassette proceeds along the transport unit the bar 11 is pressed out gradually against its springs 14 thereby increasing the lateral spacing of the bar as a whole from the belt 10. The grip of the belt on cassettes following the first one will therefore reduce until the first cassette has passed onto the device 9, thereby leading to a momentary interruption of the drive applied to the following cassettes. The process is repeated as each cassette traverses along the unit 3, thus introducing the desired short spacing between cassettes reaching the end of the unit. A similar effect could be achieved by using a non-tapered bar 11 but in which the lengths of its bearing links 15 are differed to place the rear end of the bar closer to the belt 10 than the front end.

The form of the device 9 is more fully shown in Figures 5 and 6. Its purpose is to allow cassettes transported by the unit 3 to fall into the safe 1 but to prevent any such cassette being "fished" out again through the same entrance. It comprises two, three-vaned rotors 16A and 16B located side-by-side and borne on respective axles 17. They are equipped with non-return bearings 18 which ensure that, as viewed in Figure 5, rotor 16A can only turn clockwise and rotor 16B can only turn anti-clockwise. In the illustrated position one vane 19 of each rotor is presented across the entrance 20 to the safe to define with its neighbour a platform onto which a cassette transported by the unit 3 will be placed. Associated with the rotors is an electromagnetic release device 21 (Fig 2) which normally blocks the rotors against their respective bearing-permitted senses of rotation. A sensor 22 (Fig 1) is also located in the vicinity of the rotors to sense for the presence of a cassette upon the platform defined by the rotor vanes. This sensor may be, for example an infra-red beam device or, when tagged cassettes are used as described above, another proximity antenna by which the identity of the cassette is re-checked and operation of the apparatus shut down if it is not authentic; (this would prevent the possibility of an authentic cassette being used to open the gate 6 and then some extraneous device being sent through the apparatus into the safe).

When the presence of a cassette is sensed at the device 9 (and authenticated if this function is provided) the release device 21 is pulsed by the control unit 7 to unblock the rotors 16A, 16B, which are then free to turn under the weight of the cassette and allow the latter to fall through the entrance 20 into the safe, in so doing the rotors being turned to place their next vanes into the position to receive the next cassette. The form, size and spacing of the rotor vanes is such as to ensure as far as possible that only cassettes of the correct size and shape can pass through them in this way; also that the space defined between them is in no rotary position sufficient to permit a cassette to be withdrawn from the safe past them without return rotation of the vanes which, as noted above, is precluded by the bearings 18.

In a modification of the device 9, instead of allowing the rotors 16A, 16B to be turned simply by the weight of the cassettes, they may be driven positively, e.g. by an electric motor connected to one of the rotors and with the rotors linked by a chain or belt providing simultaneous movement of the two rotors in opposite senses. When a cassette is sensed/authenticated at this modified device 9, the operation of the motor will be controlled to provide a precise 120° turn of the rotors to pass the cassette into the safe. As before, however, the rotors will be equipped with non-return bearings to ensure that they cannot be forced to turn in the opposite direction to permit removal of a cassette past them from the safe.

As shown in Figure 1, this apparatus may also include a store of empty cassettes 23 which can be supplied under the control of the unit 7 one-by-one down a chute 24 to a dispense unit 25 at the fascia in response to a user's push-button 26, preferably arranged so that one empty cassette can be dis-

pensed for each one deposited into the safe. The dispense unit 25 preferably includes a "buffer" to store one empty cassette immediately behind the fascia, providing a fast dispensing action. This unit may also be equipped with a further proximity antenna to identify the cassettes that are dispensed.

Claims

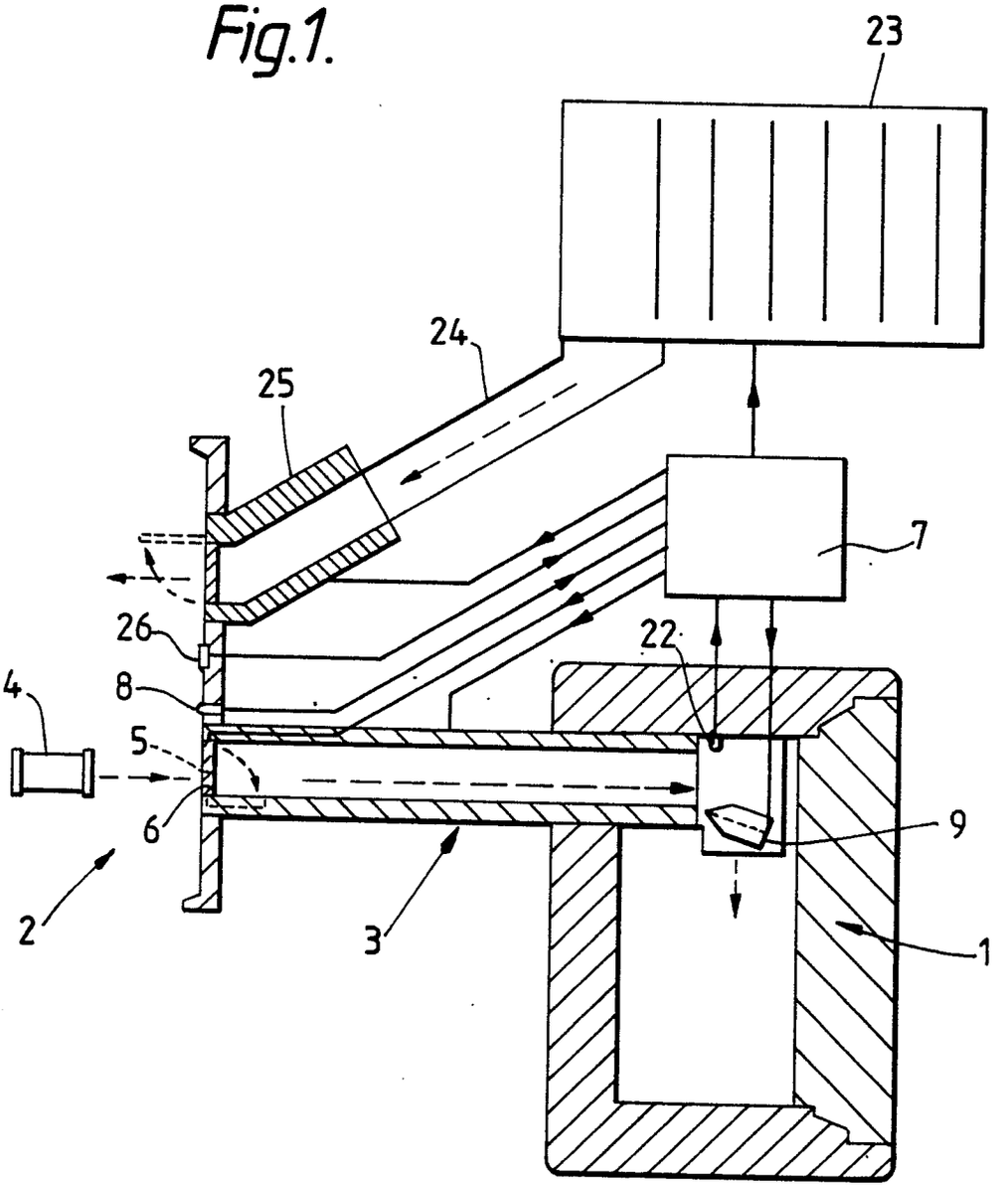
1. Security deposit apparatus comprising an access station (2) adapted to receive packages (4) of a predetermined form for deposit; a security receptacle (1) for the storage of deposited packages (4); and means (3) for the conveyance of such packages (4) from the access station (2) to the security receptacle (1); characterised in that the entrance (20) to the security receptacle (1) from the conveying means (3) is provided with a guard device (9) adapted to permit the passage of such packages (4) into the receptacle (1) from the conveying means (3) but to prevent the withdrawal of such packages (4) through that entrance (20), which device (9) comprises a pair of multi-vaned (19) rotors (16A,16B) disposed side-by-side on generally parallel axes (17), each said rotor (16A,16B) being rotatable in one direction only (18) and the directions of permitted rotation of the two rotors (16A,16B) being opposite, whereby rotation of the two rotors (16A,16B) in unison causes respective sets of their vanes (19) to collectively define channels for passing individual said packages (4) in one sense of direction only through said entrance (20).

2. Apparatus according to claim 1 comprising means (21) normally blocking the rotation of said rotors (16A,16B) in their respective permitted directions; means (22) for sensing the presence of a genuine said package (4) conveyed by said conveying means (3) to said guard device (9); and means (7) for releasing said blocking means (21) in response to a signal from said sensing means (22).

3. Apparatus according to claim 1 or claim 2 comprising motor means for driving said rotors (16A,16B) in unison through a predetermined angle to pass a said package (4) through said entrance (20) to the security receptacle (1).

4. Security deposit apparatus comprising an access station (2) adapted to receive packages (4) of a predetermined form for deposit; a security receptacle (1) for the storage of deposited packages (4); and means (3) for the conveyance of such packages (4) from the access station (2) to the security receptacle (1); characterised in that said conveying means (3) comprises a driven belt (10) against which such packages (4) are pressed by a spring-biased (14) bar (11) such as to cause the packages (4) to be driven along a track (12) defined between said belt (10) and bar (11), the bar (11) being configured or borne such as to present a surface converging towards the belt (10) so that as a leading package (4) is driven along said track (12) the bar (11) is increasingly displaced away from the belt (10) and thereby relieves the pressure of the bar (11) acting upon a trailing package (4) until the leading package is delivered to said guard device (9).

Fig.1.



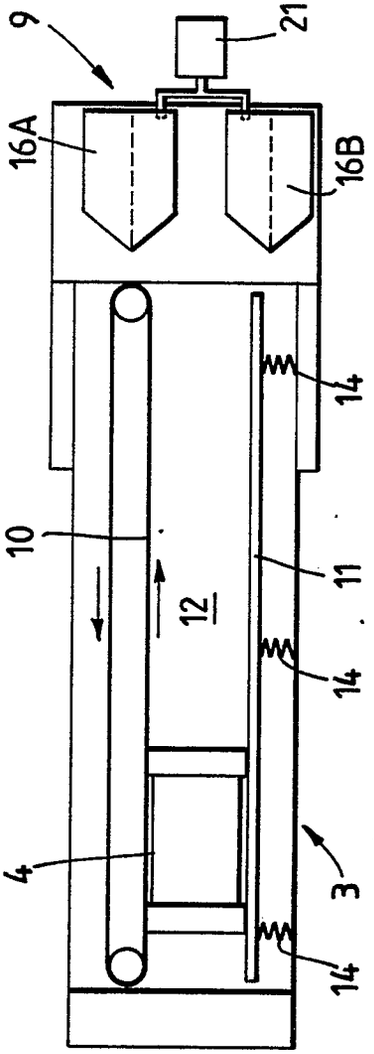


Fig.2.

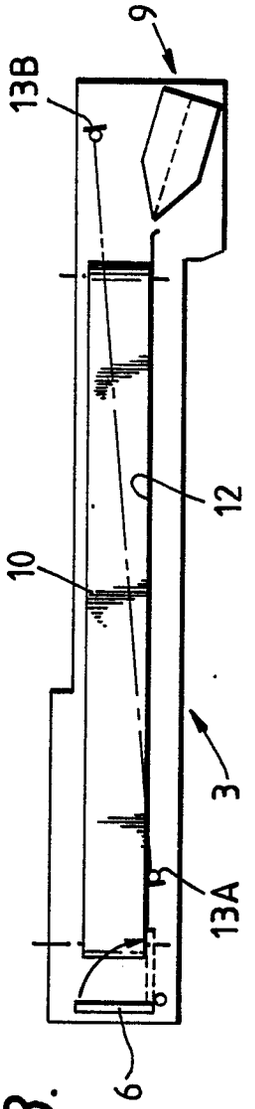


Fig.3.

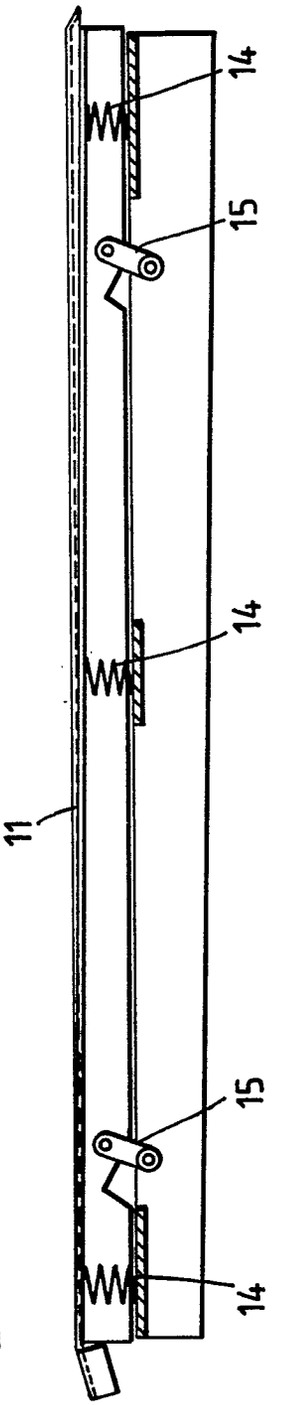


Fig.4.

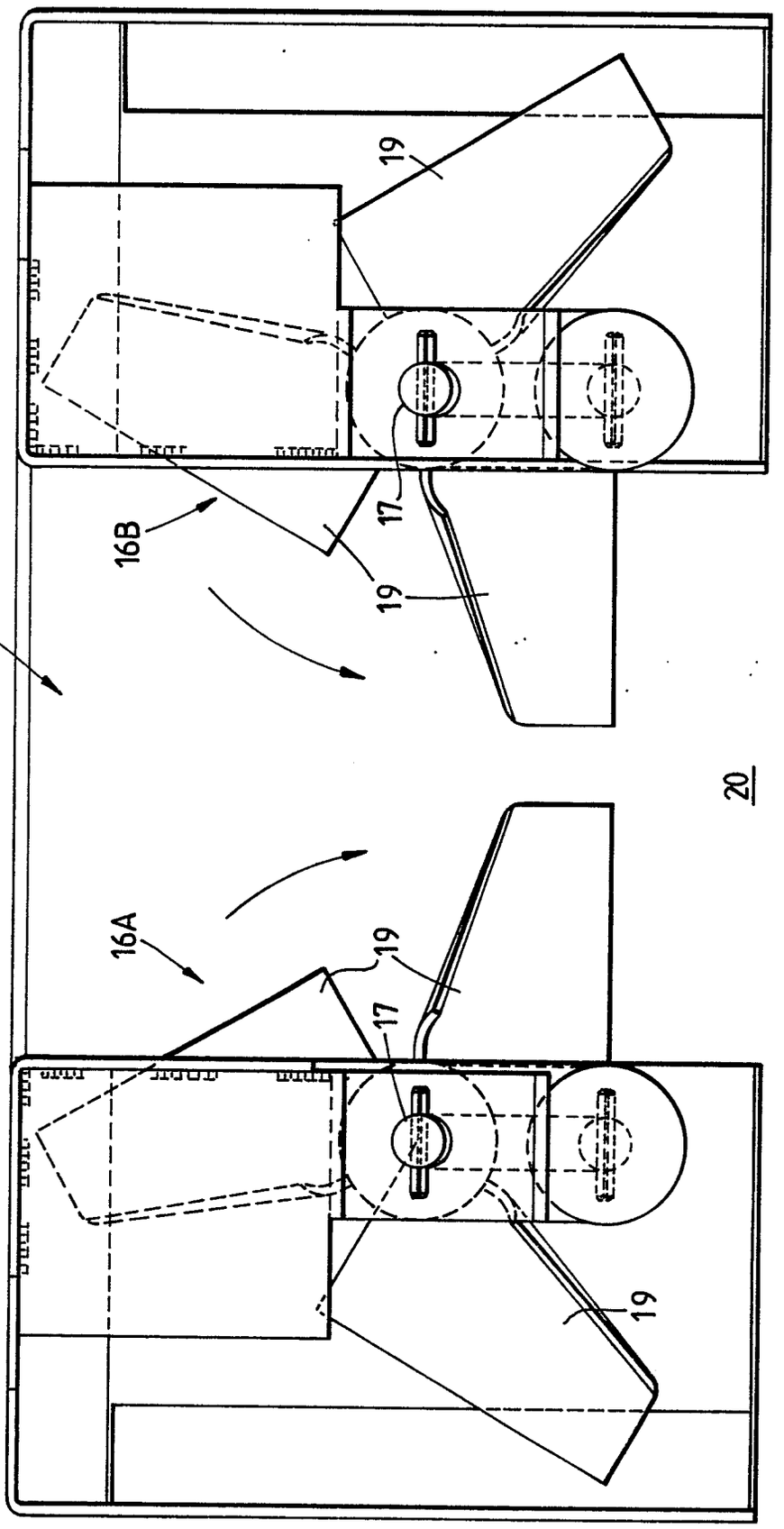


Fig.5.

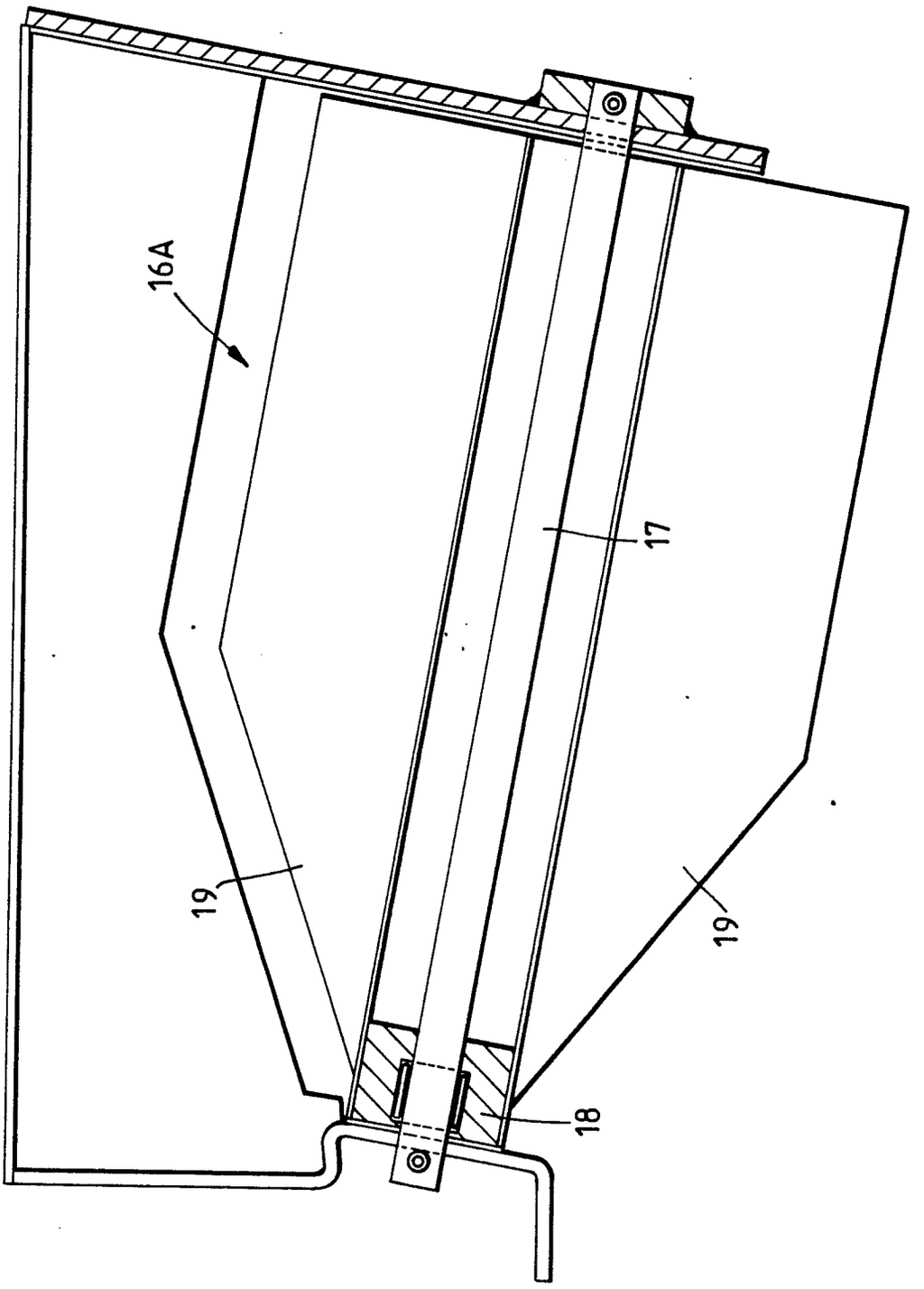


Fig.6.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 87 20 2012

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)
A	US-A-3 836 980 (GROSSWEILER) * Abstract * ---	1	E 05 G 7/00
A	DE-A-2 140 014 (DE STAAT DER NEDERLANDEN) * Figures 1-5 * ---	1	
A	US-A-3 942 435 (AULTZ) * Abstract * -----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

E 05 G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	02-02-1988	NEYS B.G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)