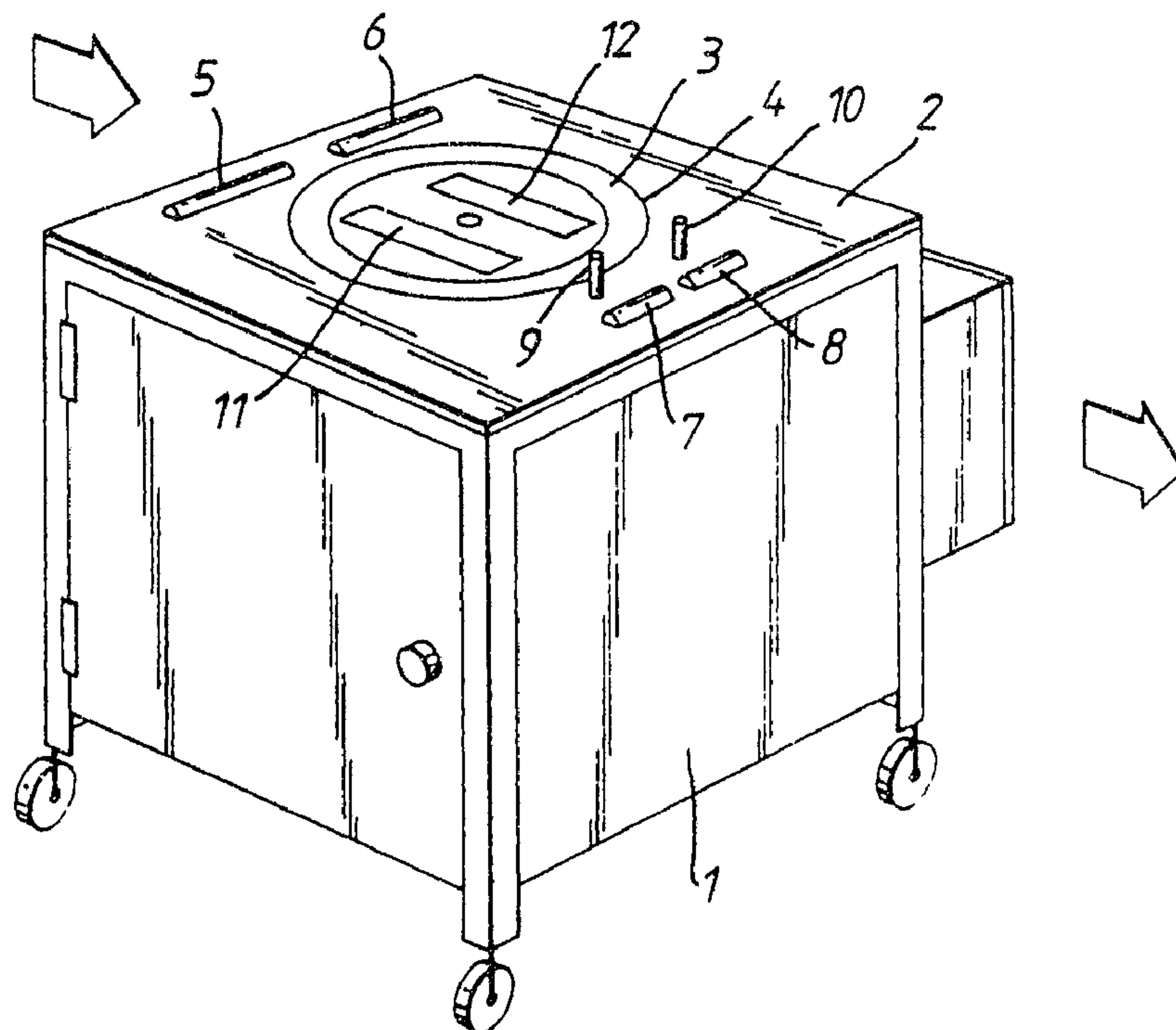




(86) Date de dépôt PCT/PCT Filing Date: 1991/11/19
(87) Date publication PCT/PCT Publication Date: 1992/06/11
(45) Date de délivrance/Issue Date: 2003/09/16
(85) Entrée phase nationale/National Entry: 1993/04/15
(86) N° demande PCT/PCT Application No.: GB 1991/002048
(87) N° publication PCT/PCT Publication No.: 1992/009481
(30) Priorité/Priority: 1990/11/22 (9025454.1) GB

(51) Cl.Int.⁵/Int.Cl.⁵ B65G 47/244
(72) Inventeur/Inventor:
BEASLEY, PETER GEORGE, GB
(73) Propriétaire/Owner:
PAKSEAL INDUSTRIES LIMITED, GB
(74) Agent: MACRAE & CO.

(54) Titre : DISPOSITIF A FICELER ADAPTABLE A UN CONVOYEUR
(54) Title: BUNDLE TURNING UNITS FOR USE WITH CONVEYORS



(57) **Abrégé/Abstract:**

A bundle-turning unit (1) of the in-line type has a turntable in the form of a lift member (3) of annular outline, which is housed within a platen (2). The lift member (3) is movable between a lowered retracted position and a raised operative position in which the lift member (3) can also be rotated. With the lift member (3) in the retracted position a bundle is fed to the turntable until it co-operates with stop means (9, 10) in which position it is superimposed over the lift member (3). The bundle is then raised above the platen (2) by the lift member (3), the stop means (9, 10) are retracted into the platen (2) and the bundle is rotated through 90°. The lift member (3) then lowers the bundle onto the conveyor transit means (11, 12) which convey the bundle from the turntable in the same direction as the feed.



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ :

B65B 13/18, B65G 47/244

A1

(11) International Publication Number:

WO 92/09481

(43) International Publication Date:

11 June 1992 (11.06.92)

(21) International Application Number: PCT/GB91/02048

(22) International Filing Date: 19 November 1991 (19.11.91)

(30) Priority data:

9025454.1

22 November 1990 (22.11.90) GB

(71) Applicant (for all designated States except US): PAKSEAL INDUSTRIES LIMITED [GB/GB]; Cordwallis Trading Estate, Maidenhead, Berkshire SL6 7DB (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only) : BEASLEY, Peter, George [GB/GB]; 4 Court Lodge Cottages, East Farleigh, Maidstone, Kent ME15 0JL (GB).

(74) Agent: BARKER, BRETTELL & DUNCAN; 138 Hagley Road, Edgbaston, Birmingham B16 9PW (GB).

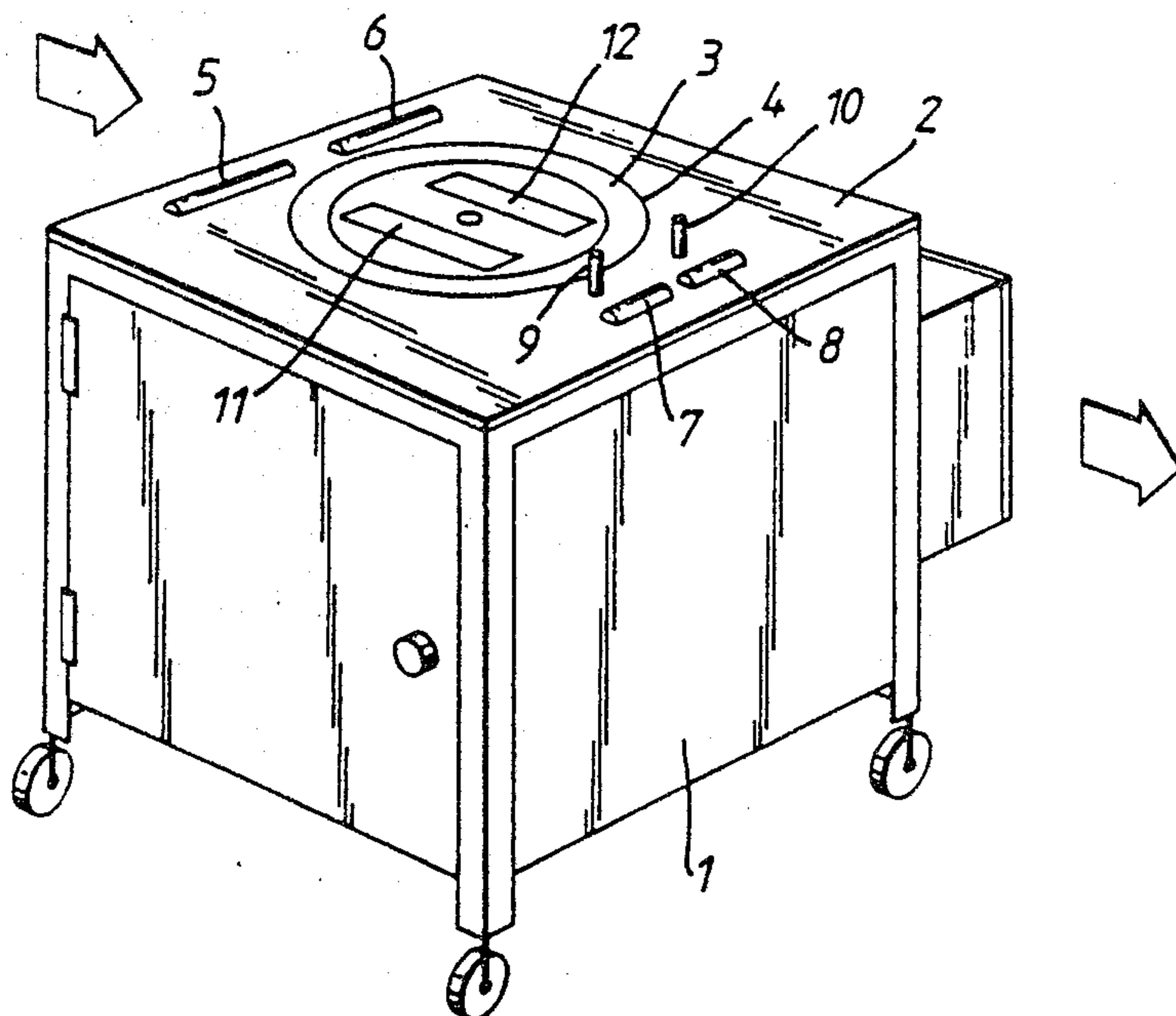
2094125

(81) Designated States: AT (European patent), BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent), US.

Published

With international search report.

(54) Title: IMPROVEMENTS IN BUNDLE TURNING UNITS FOR USE WITH CONVEYORS



(57) Abstract

A bundle turning unit (1) of the in-line type has a turntable in the form of a lift member (3) of annular outline, which is housed within a platen (2). The lift member (3) is movable between a lowered retracted position and a raised operative position in which the lift member (3) can also be rotated. With the lift member (3) in the retracted position a bundle is fed to the turntable until it co-operates with stop means (9, 10) in which position it is superimposed over the lift member (3). The bundle is then raised above the platen (2) by the lift member (3), the stop means (9, 10) are retracted into the platen (2) and the bundle is rotated through 90°. The lift member (3) then lowers the bundle onto the conveyor transit means (11, 12) which convey the bundle from the turntable in the same direction as the feed.

IMPROVEMENTS IN BUNDLE TURNING UNITS
FOR USE WITH CONVEYORS

This invention relates to bundle turning units of the in-line type for use in turning a bundle through substantially 90° with respect to the direction of feed movement of the bundle on a transit conveyor.

Bundle turning units may be disposed between two strapping machines. A bundle having been strapped in a first direction by one machine can then be turned through 90° by the unit to enable it to be strapped in a second direction at 90° to the first by the other machine.

Bundle turning units of the in-line type including turntables are already known. Such turntables may be of the grid or moving head type. In such known constructions the grid and the moving head, respectively, each rise above the level of the transit conveyor. This leaves gaps which may constitute a hazard for an operator, and may cause damage to the bundle.

According to our invention a bundle turning unit of the in-line type comprises a turntable in the form of a lift member of annular outline which is housed within a relatively stationary platen and is movable between a raised operative position in which the lift member can also be moved angularly about an axis normal to and with respect to the platen, and a lowered retracted position, the annular lift member extending below the plane of the platen when the lift member is in the raised operative position.

2049125

2

The annular design of the accessible part of the lift member ensures that nothing of any substantial size can be caught and damaged by the lift member retracting.

In the lowered retracted position a bundle is fed to the turntable in a feed direction until it is superimposed over the lift member at an orientation station. The bundle is then raised above the platen by movement of the lift member into the operative position, and the lift member can then be moved angularly to rotate the bundle through a corresponding angular distance, suitably 90° , whereafter the lift member is returned to its lowered position, with the bundle supported by the platen for transfer from the turntable in a direction corresponding to the feed direction.

Preferably the lift member projects through an opening in the platen which is of complementary outline. This has the advantage that an area of the platen surrounded by the opening can be used to accommodate a transit conveyor system operable following orientation of the bundle, at least to assist transfer of the bundle from the turntable after the lift member has returned to its retracted position.

The orientation station may be defined by stop means for arresting forward movement of the bundle in the feed direction and which is conveniently located to the side of the lift member remote from feed direction.

In this way the bundle can be positively positioned relative to the lift member prior to it lifting the bundle.

2049125

PCT/GB 91 / 02048
-4 December 1992

2a

The stop means may comprise a barrier which is normally upstanding from the platen for co-operation by the leading edge of the bundle to position the bundle relative to the lift member, but which is retractable into the platen to avoid contact with the bundle as it is being rotated and subsequently transferred from the turntable.

Preferably the barrier is constituted by a pair of positioning posts which are spaced transversely with respect to the feed direction.

2094125

3

The movements of the lift member, the barrier, and the transit conveyor take place in a continuous sequence of which operation is initiated by sensing means sensing the position of the bundle. The sensing means initially cause the barrier to rise into an arresting position whereafter, when the bundle co-operates with the barrier, the lift member rises, the barrier retracts into the platen, and the lift member then rotates the bundle through substantially 90° before lowering it onto the transit conveyor, which then becomes operable to transfer the bundle from the turntable.

One embodiment of our invention is illustrated in the accompanying drawings in which:-

Figure 1 is a perspective view of a bundle turning unit of the in-line type;

Figure 2 illustrates, schematically, the steps of turning a bundle through substantially 90°;

Figure 3 is a top perspective view of the turning unit of Figure 1 with a bundle omitted;

Figure 4 is a view similar to Figure 3 but with a bundle arrested by positioning posts; and

Figure 5 illustrates the rotatable lift member in the raised position.

The bundle turning unit illustrated in the accompanying drawings comprises a wheel mounted free standing base unit 1 adapted to be positioned between the output end of a input or feed conveyor, and the input end of an output conveyor. The top surface of

2094125

4

the base unit 1 is constituted by a platen 2 in the form of a rigid metal plate which is disposed in a common, generally horizontal, plane with the planes of the input and output conveyors.

5

A lift member 3 of annular section is mounted in the unit for rotation substantially through 90° in either a clockwise or an anti-clockwise direction, and for movement between a retracted position in which it is substantially flush with the plane of the platen 2 and a raised operative position in which it projects above the plane through an opening 4 of complementary annular outline in the platen 2.

10

A pair of input rollers 5, 6 are freely rotatably mounted in a region of the platen 2 between the input end and the lift member 3 with their axes of rotation aligned in a direction normal to the feed from the input conveyor. The rollers 5, 6 project slightly above the plane of the platen 2.

15

20

A similar pair of output rollers 7, 8 are rotatably mounted in the platen 2 in a region between the lift member 3 and the output end of the platen with their axes of rotation aligned and lying in a direction parallel to the axes of the rollers 5, 6. Again the rollers 7, 8 project slightly above the plane of the platen 2.

25

Stop means comprising a barrier is constituted by a pair of upstanding retractable positioning posts 9, 10. The posts 9, 10 project through the platen 2 and are disposed between the lift member 3 and the rollers 7, 8. The posts 9, 10 lie on a transverse axis of the platen which is spaced between and is

30

35

parallel to the axes of rotation of the two pairs of rollers.

5 A transit conveyor system comprising a pair of
endless belt conveyors 11, 12 is housed in the circular
area of the platen 2 defined within the lift member 3.
The two conveyors 11, 12 are symmetrically arranged,
being aligned transversely and spaced to opposite sides
10 of the diameter of the lift member 3. The direction of
travel of the belts of the two conveyors 11, 12
coincides with the feed direction of the input and
output conveyors.

15 The angular movement of the lift member 3, and its
movement between the lowered and raised positions, are
each controlled by a pneumatic cylinder under the
control of a respective solenoid-operated valve, and
the movements of the positioning posts 9, 10 between
the raised and retracted positions are controlled by a
20 further pneumatic cylinder under the control of a
third, similar, solenoid-operated valve. The three
valves are operated in a predetermined sequence in
responsive to signals from sensing means comprising a
photo-electric cell which detects the position of a
25 bundle on the platen.

The output rollers 7, 8, and the conveyors 11, 12
are all continuously driven in a forward direction by
an electric motor.

30

In a normal inoperative position the positioning
posts 9, 10 are retracted below the plane of the
platen 2, and the lift member 3 is substantially flush
with the surface of the platen 2. A bundle is fed to
35 the turning unit by the input or feed conveyor, for
example with the bundle having been strapped in a first

2094125

6

direction normal to the direction of feed. The position of the bundle is detected by the photo-electric cell which initiates operation of the respective solenoid-operated valve to cause the posts 9, 10 to rise and arrest forward movement of the bundle 20 as shown in Figure 4.

After a time delay, initiated by the photo-electric cell, the lift member 3 is moved into its raised operative position (Figure 5) by operation of the respective solenoid-operated valve, with the third solenoid-operated valve being actuated to cause the posts 9, 10 to be retracted into a retracted position at least substantially flush with the surface of the platen 2. The lift member 3 is raised to a extent sufficient to raise the bundle 20 above the surface of the platen 2, and the remaining solenoid-operated valve is then operable to cause the lift member 3 to move angularly through substantially 90°, in turn orientating the bundle 20 through a corresponding angular distance. The lift member 3 is then returned to its retracted position to lower the bundle 20 onto the conveyors 11, 12 which, in conjunction with the rollers 7, 8, act to move the bundle onto the output conveyor. This can transfer the bundle to a bundle strapping machine arranged to strap the bundle in a second direction, for example at right angles to any first line of strapping.

The lift member 3 is adapted to be rotated through 90° in either a clockwise or an anti-clockwise direction. If desired it may be arranged to rotate alternatively through these two directions.

35

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A bundle turning unit of the in-line type comprising a turntable in the form of a lift member, the lift member (3) being of annular outline and being housed within a relatively stationary platen (2), the lift member (3) being movable between a raised operative position, in which the lift member (3) can also be moved angularly about an axis normal to and with respect to the platen (2), and a lowered retracted position, characterised in that the annular lift member extends above and below the plane of the platen when the lift member is in the raised operative position and further characterised in that the lift member (3) projects through an opening (4) in the platen (2), which is of complementary outline.

2. A bundle turning unit according to claim 1, characterised in that a transit conveyor system (11, 12) is provided within the area of the platen (2) which is defined by the opening (4) for the lift member (3).

3. A bundle turning unit according to claim 1, provided with stop means (9, 10) for arresting a forward movement of a bundle in a feed direction, characterised in that the stop means (9, 10) are located so as to arrest the bundle when the bundle is substantially above the lift member (3).

4. A bundle turning unit according to claim 3, characterised in that the stop means (9, 10) are located to the side of the lift member (3) remote from the feed direction.

5. A bundle turning unit according to claim 3,

characterised in that the stop means (9, 10) comprise a barrier which is upstanding from the platen (2) for co-operation by a leading edge of the bundle to position the bundle relative to the lift member (3), and which is retractable into the platen (2) to avoid contact with the bundle as it is being rotated and subsequently transferred from the turntable.

6. A bundle turning unit according to claim 5, characterised in that the barrier comprises a pair of positioning posts (9, 10) which are spaced transversely with respect to the feed direction.

7. A bundle turning unit according to claim 3, characterised by sensing means for sensing the position of the bundle, in which operation of the unit takes place in a continuous sequence which is initiated by the sensing means.

8. A bundle turning unit according to claim 7, characterised in that the sensing means is a photoelectric cell.

Fig. 1.

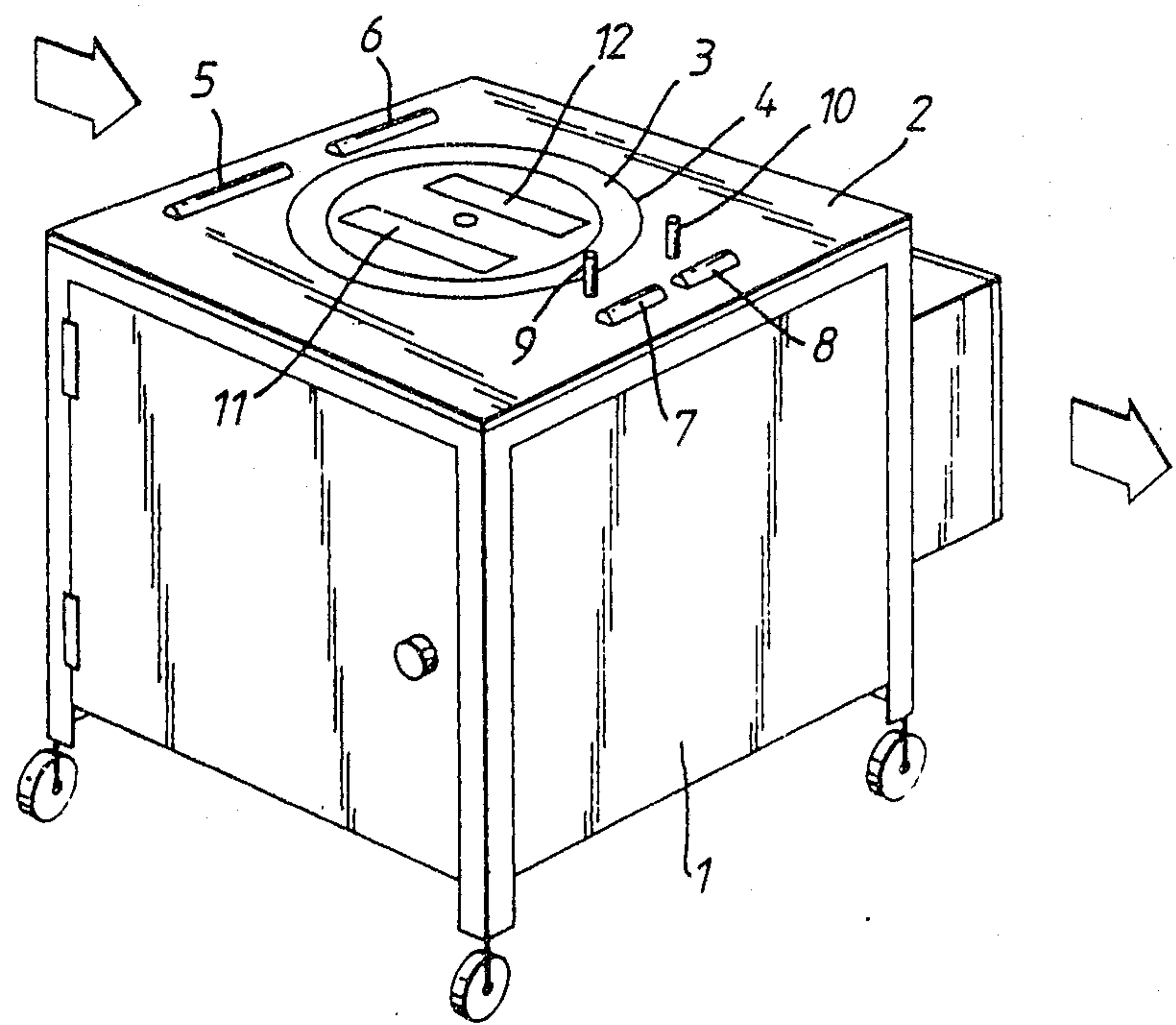


Fig. 2.

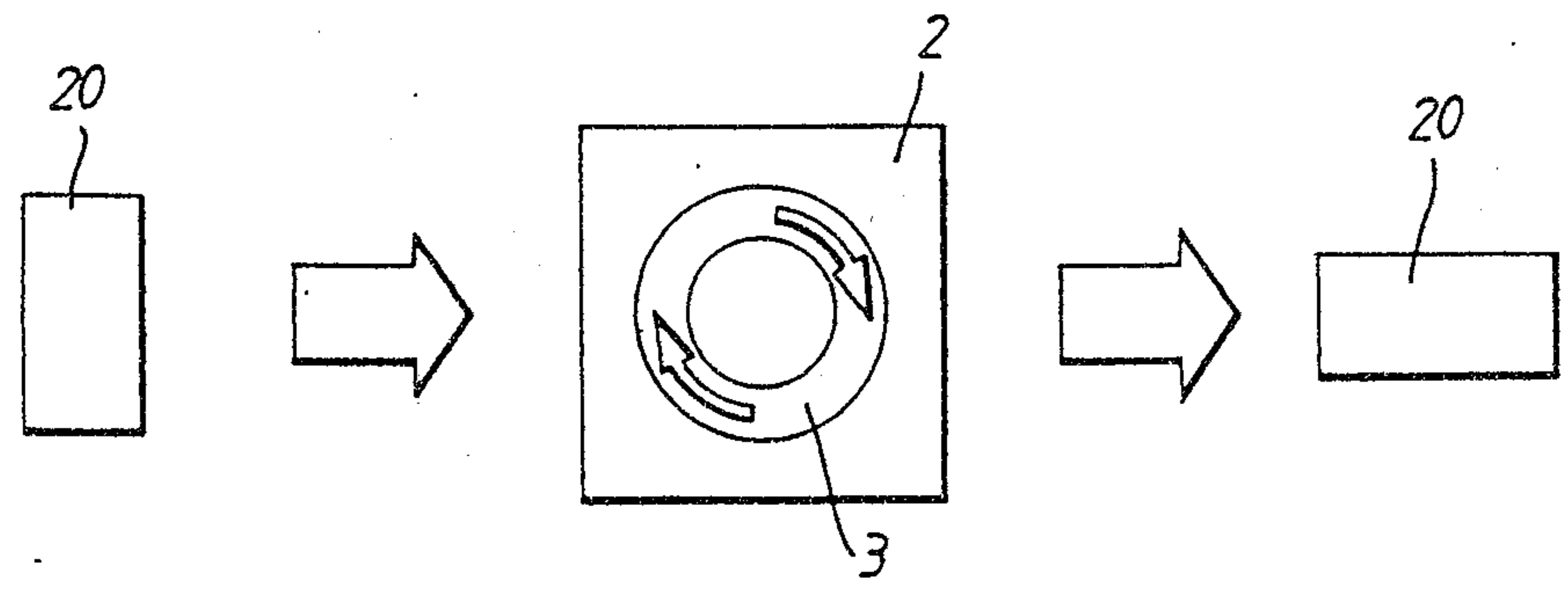


Fig. 3.

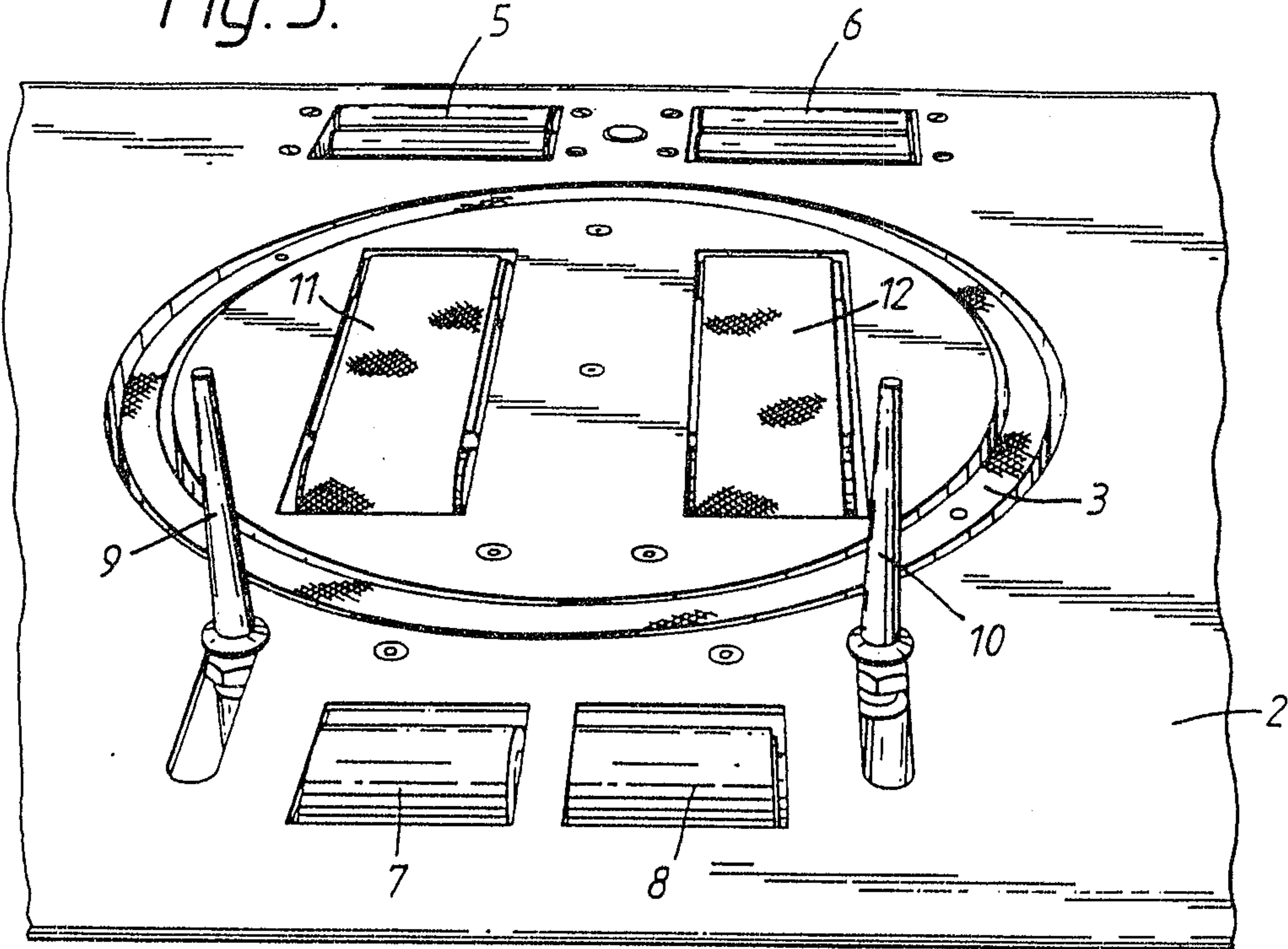
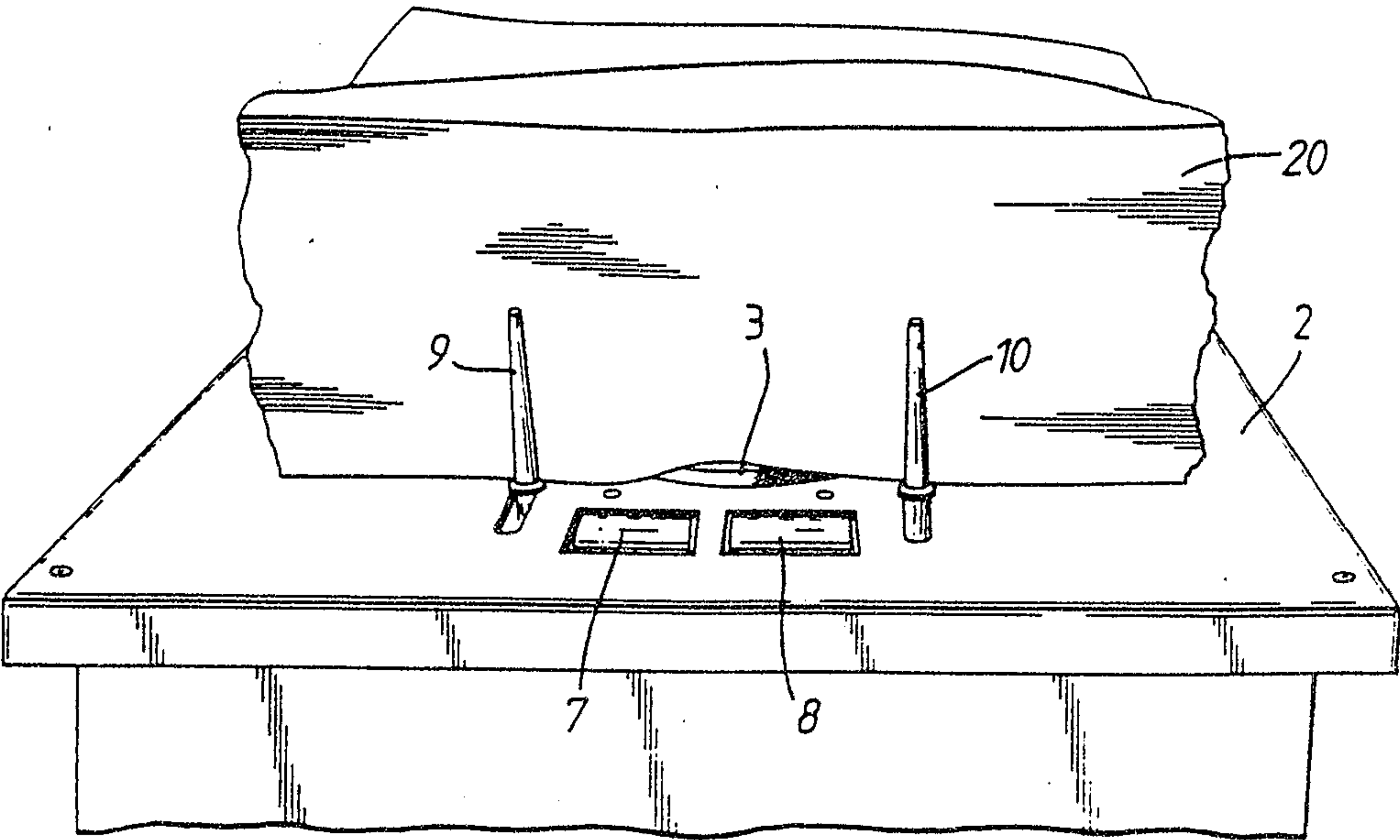


Fig. 4.



3/3

2094125

Fig. 5.