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(54) Air-cooled oven, in particular for packaging products with heat-shrinkable film.

(57) An oven, particularly for packaging products with heat-shrinkable film, comprises a chamber or tunnel (10) structurally in the form of an inner jacket (15) through which hot air is circulated by a first fan (20) driven by a motor (19), and an outer insulating jacket (17). According to the invention, cold ventilation air is circulated through said outer jacket (17).

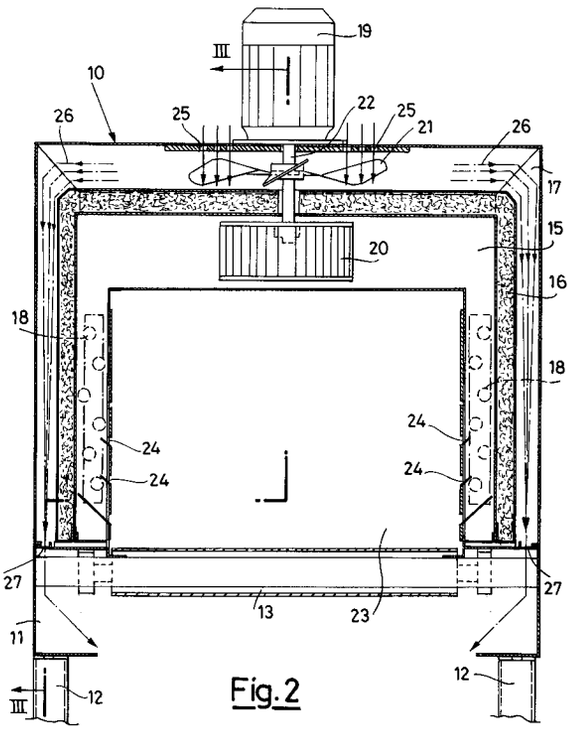

Fig.2

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This invention relates to an air-cooled oven intended particularly but not exclusively for packaging products with heat-shrinkable film.

As is well known to the expert of the art, products can be packaged in heat-shrinkable film in two successive stages.

These comprise a first stage in which the product is wrapped and possibly sealed in a film of heat-shrinkable material, and a second stage in which the product wrapped in the film is fed into a hot air circulation oven which shrinks the film onto the product or products to be packaged.

Ovens of this type consist structurally of a metal chamber or tunnel provided internally with electrical resistance elements for heating the air, which is circulated by one or more fans.

The product or products to be packaged are fed, wrapped in the film, through the tunnel by a roller or belt conveyor.

Ovens of this type produce a considerable quantity of heat, and even though the tunnel walls comprise not only an inner jacket containing the resistance elements but also an outer insulated jacket, continuous use of the oven results in the outer jacket reaching a temperature exceeding 50 ° C within a very short time.

The temperature of the working environment in the vicinity of the oven can consequently become unbearable, and the oven can represent a source of danger to persons who accidentally touch its walls, by causing serious burns.

A further drawback of ovens of known type is that the conveyor rollers or belt extending through the tunnel are subjected to heating, with the result that the film wrapping the package tends to melt, hence sticking to the rollers and running down. This results in improper conveyor operation and an imperfect final package.

The main object of the present invention is to obviate the aforesaid drawbacks of the known art, this object being attained according to the invention by an oven, particularly for packaging products with heat-shrinkable film, of the type comprising a chamber or tunnel (10) structurally in the form of an inner jacket (15) through which hot air is circulated by a first fan (20) driven by a motor (19), and an outer insulating jacket (17), characterised in that cold ventilation air is circulated through said outer jacket (17).

Preferably said ventilation air is circulated by a second fan (21) keyed onto the exit shaft (22) of the motor (19) which drives the first fan (20) circulating hot air.

Preferably said ventilation air is drawn in through a series of apertures (25) provided in the tunnel roof, and is discharged through a series of apertures (27) provided at the base of the tunnel.

The structural and operational characteristics of the invention and its advantages over the known art will be more apparent from an examination of the following description, given with reference to the accompanying schematic drawings, which show one embodiment of an oven incorporating the principles of the invention. On the drawings:

Figure 1 is a perspective view of the oven according to the invention;

Figure 2 is a section on the line II-II of Figure 3;

Figure 3 is a section on the line III-III of Figure 2;

Figure 4 is a top plan view in the direction of the arrow F of Figure 3; and

Figure 5 is a plan view taken from below in the direction of the arrow F1 of Figure 3.

With reference to the drawings, the air-cooled oven according to the invention consists structurally of a metal chamber or tunnel 10 mounted on a base frame 11 which rests on legs 12. The base frame also carries a conveyor for passing the products to be packaged (not shown) through the tunnel 10, this tunnel in the illustrated embodiment consisting of a series of rollers 13 driven by a motor 14.

With particular reference to Figure 2, the tunnel 10 comprises an inner hot air circulation jacket 15 covered externally with a layer of insulating material 16, and an outer cold air circulation jacket 17.

The reference numeral 18 indicates a series of air-heating electrical resistance elements provided in the side of the inner jacket 15.

A motor 19 mounted on the top of the tunnel 10 drives a first fan 20 for hot air circulation, housed within the inner jacket 15, and a second fan 21 for cold air circulation, housed within the outer jacket 17. As can be clearly seen from the drawings, said two fans are keyed onto the same exit shaft 22 of the motor 19.

The air heated within the inner jacket 15 by the electrical resistance elements 18 is fed by the fan 20 into the heated compartment 23 of the tunnel 10 through a series of apertures 24 provided in the side walls of the inner jacket 15.

The ventilation air is drawn in by the fan 21 through a series of apertures 25 provided in the roof of the tunnel 10, and is circulated through the outer jacket 17 in the directions indicated by the arrows 26, to be then discharged through a series of apertures 27 provided at the base of the tunnel in the frame 11, as clearly shown in Figures 2 and 3.

It can also be seen that the ventilation air grazes the conveyor rollers 13, so maintaining them at a temperature such as to prevent the package film melting.

In this manner it is apparent that the heat provided within the oven and transmitted to the

outside is removed by the cold ventilation air which continuously circulates within the outer jacket 17.

In this manner the outer wall of the tunnel 10 remains during its entire operating period always at a low non-dangerous temperature which has no effect on the surrounding environment, even if operation is continuous for several hours.

If required, the ventilation air discharged through the apertures 27 can be piped to the outside of the working environment.

Finally, it should be noted that the air-cooled oven according to the invention can be constructed at minimum cost compared with an insulated oven, as it is necessary to merely provide the second fan 21 and the apertures 25, 27 for intake and discharge of ventilation air respectively. This is because the outer jacket 17 is already provided, it being necessary merely to increase its height to enable it to contain the fan 21.

The object stated in the introduction to the description is therefore attained.

Claims

1. An oven, particularly for packaging products with heat-shrinkable film, of the type comprising a chamber or tunnel (10) structurally in the form of an inner jacket (15) through which hot air is circulated by a first fan (20) driven by a motor (19), and an outer insulating jacket (17), characterised in that cold ventilation air is circulated through said outer jacket (17).

2. An oven as claimed in claim 1, characterised in that said ventilation air is circulated by a second fan (21) keyed onto the exit shaft (22) of the motor (19) which drives the first fan (20) circulating hot air.

3. An oven as claimed in claim 2, characterised in that said ventilation air is drawn in through a series of apertures (25) provided in the tunnel roof, and is discharged through a series of apertures (27) provided at the base of the tunnel.

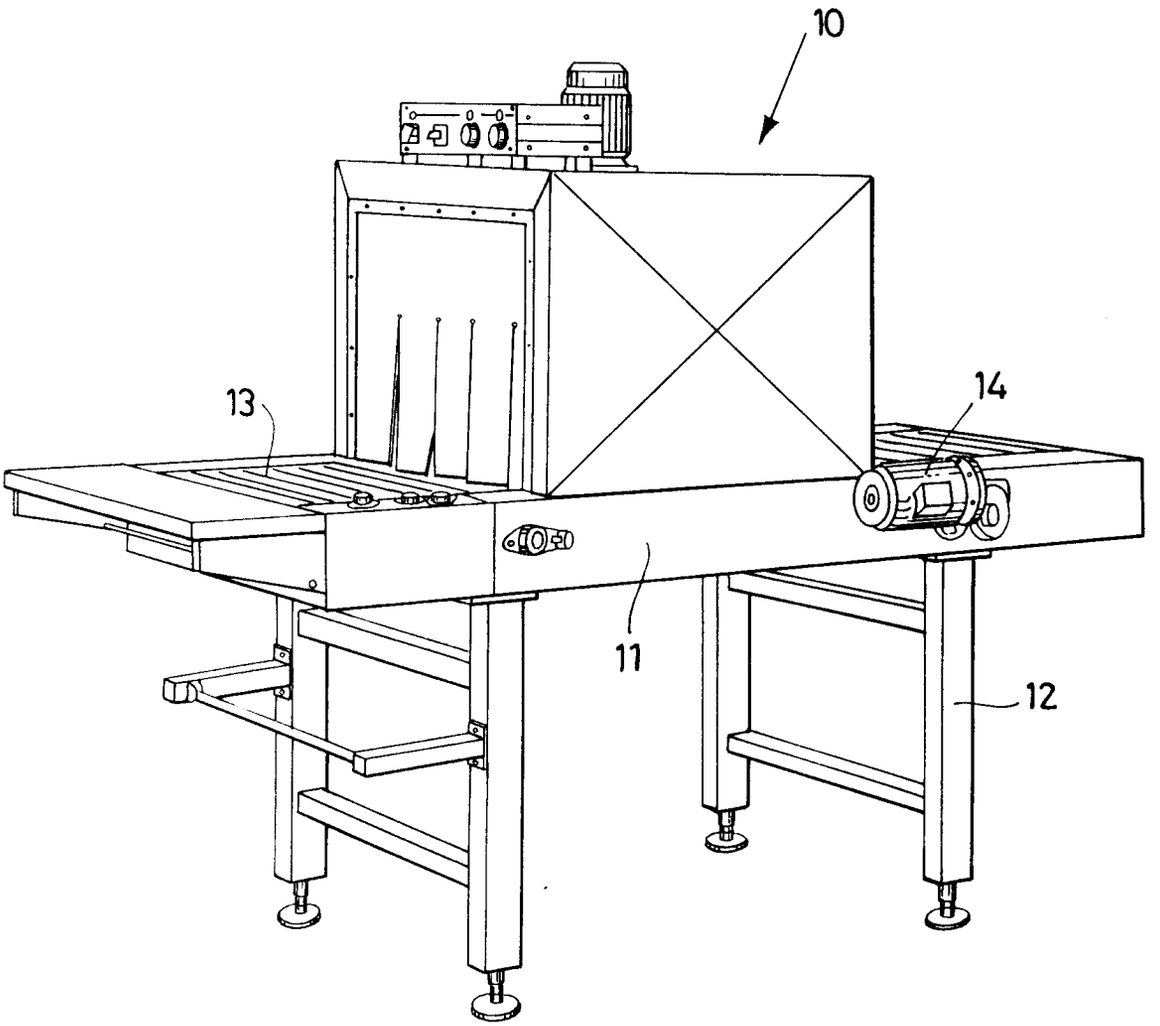

Fig.1

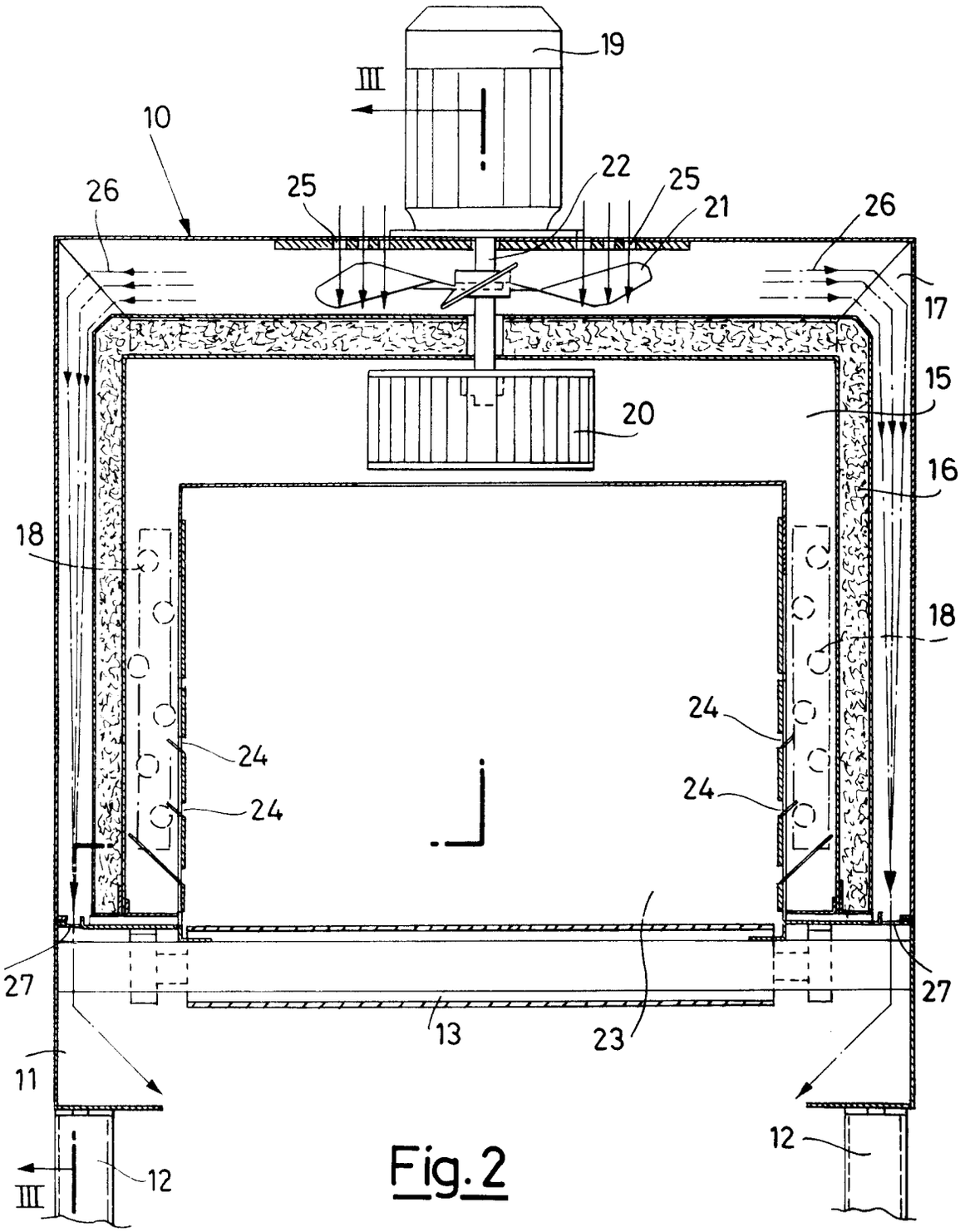
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Fig. 2

Fig.3

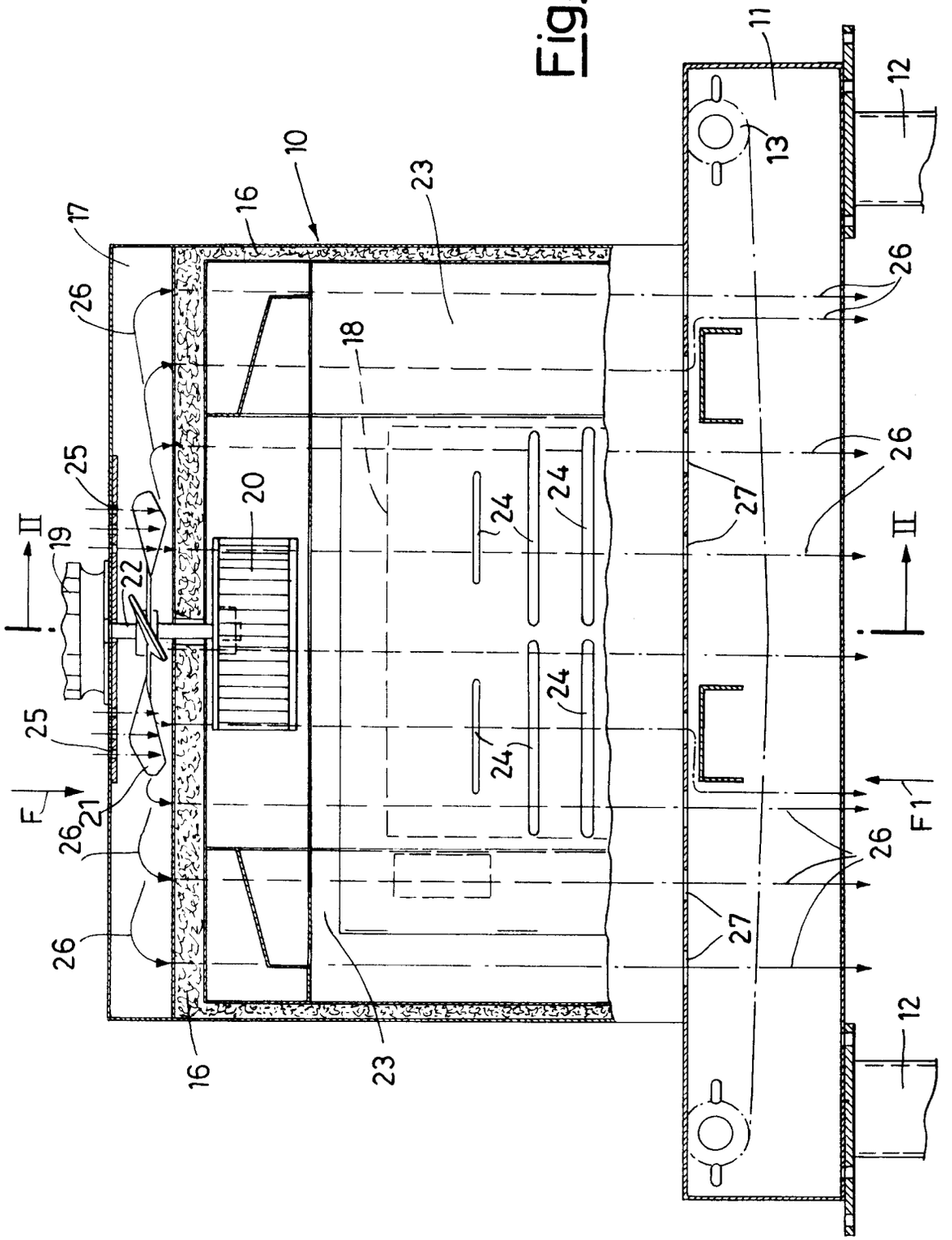


Fig.4

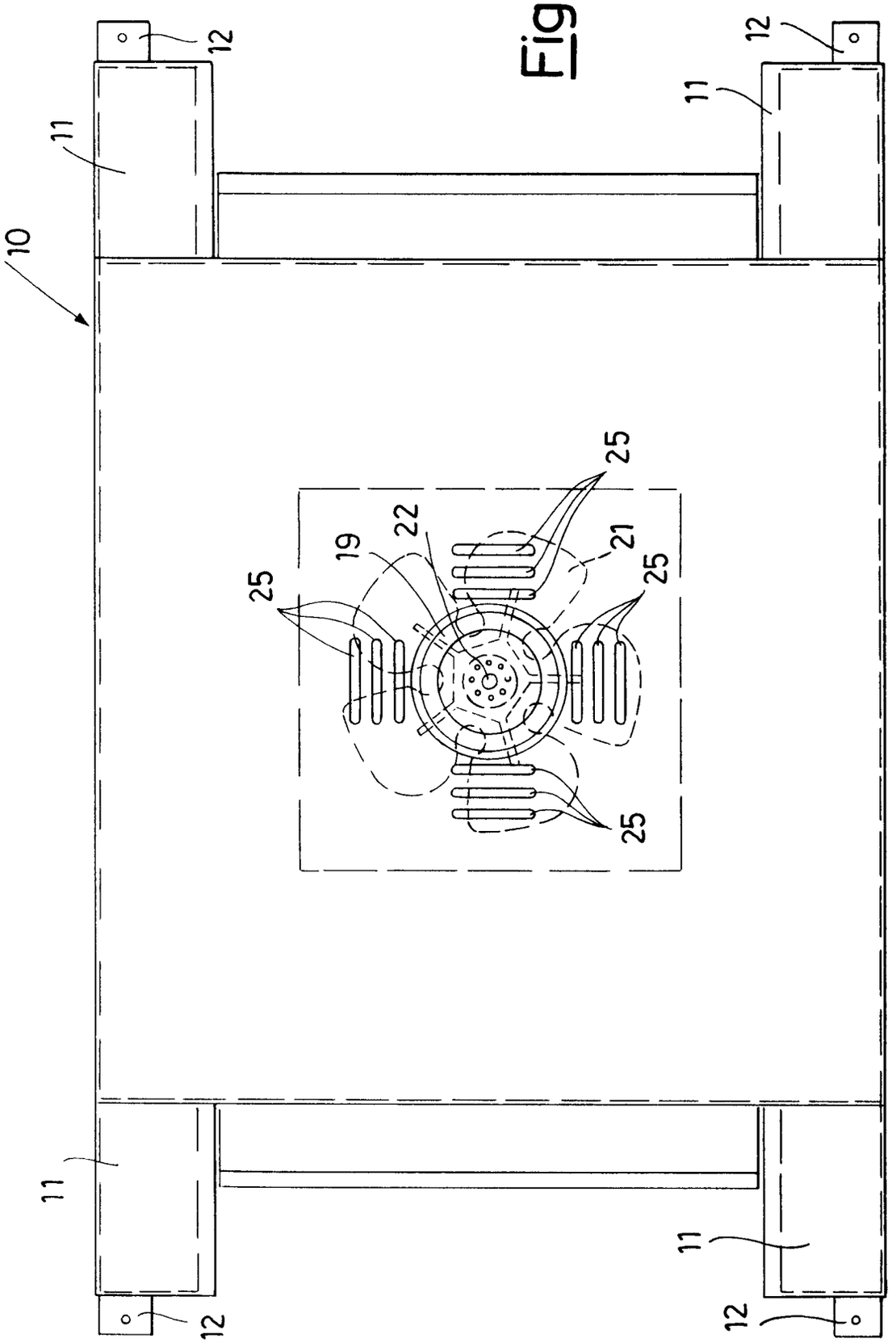
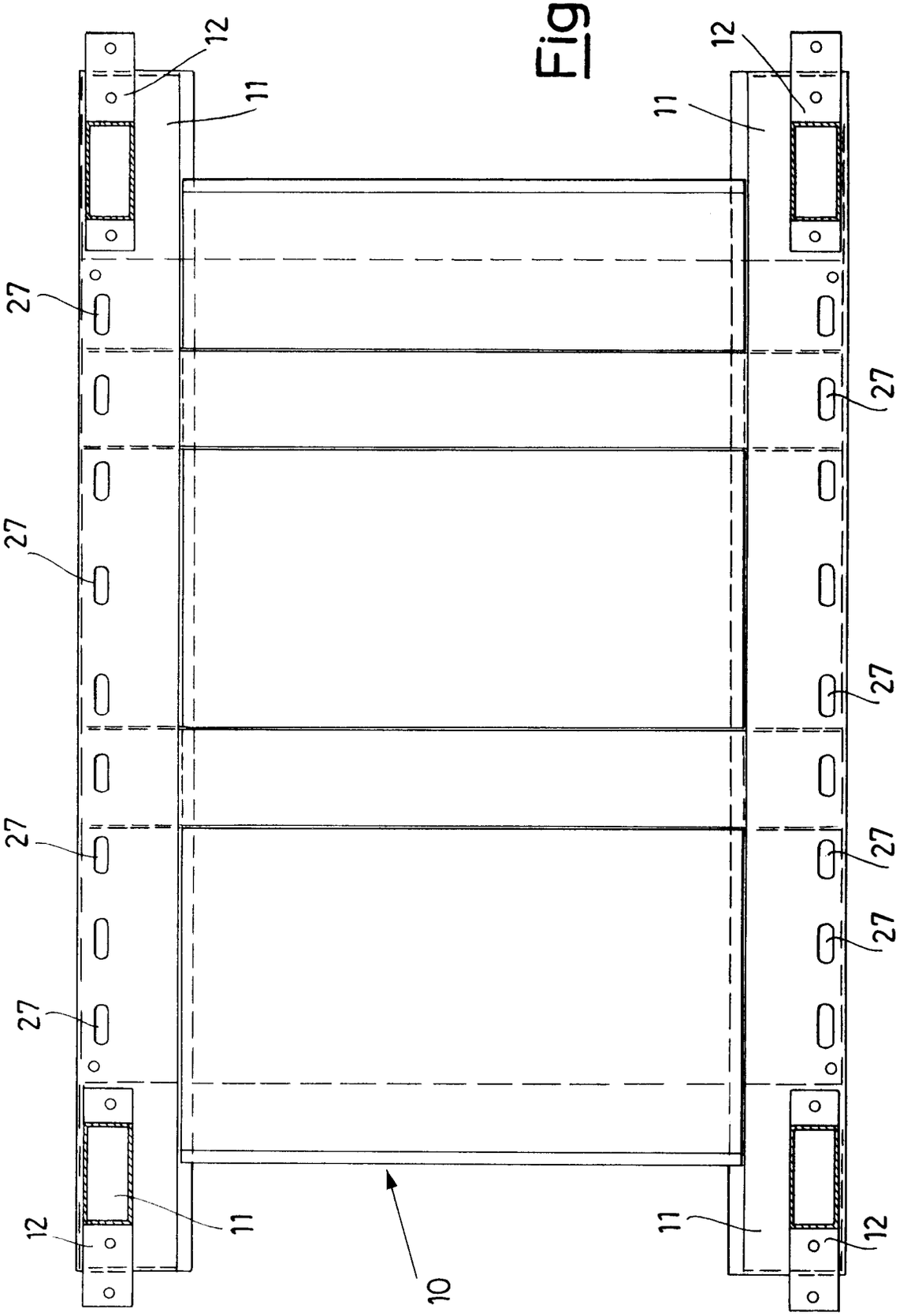


Fig.5



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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 2986

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.5)
X	DE-A-3 924 871 (D. KICHERER) * column 6, line 2 - line 64; figures *	1	B65B53/06
A	US-A-3 668 817 (W. GRACE) * column 2, line 12 - line 70; figures *	1,3	
A	US-A-3 744 146 (J. NICHOLS) * column 3, line 26 - column 4, line 41; figures *	1	
A	US-A-3 378 989 (S. DENKER) * column 2, line 1 - line 69; figures *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
B65B F27B F27D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 FEBRUARY 1993	JAGUSIAK A.H.G.

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