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

(11) EP 1 145 765 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
17.10.2001 Bulletin 2001/42

(51) Int Cl.[7]: **B02C 18/30**

(21) Application number: **01109113.9**

(22) Date of filing: **12.04.2001**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **14.04.2000 IT BO000221**

(71) Applicant: **LA MINERVA DI CHIODINI MARIO S.R.L.**
I-40138 Bologna (IT)

(72) Inventor: **Salati Chiodini, Daniele**
40138 Bologna (IT)

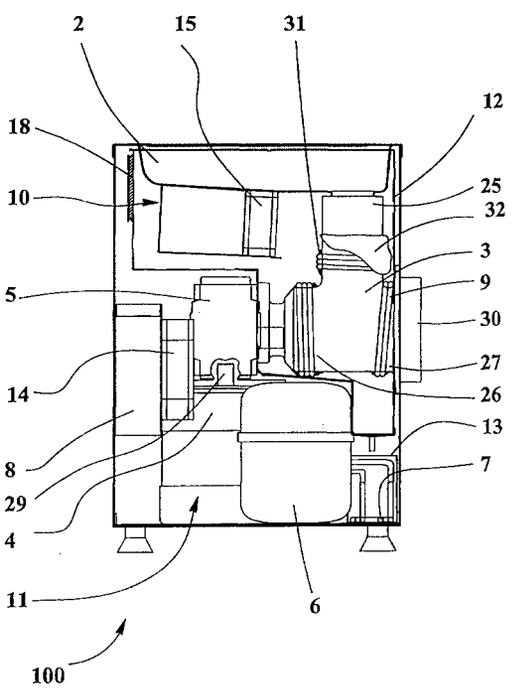
(74) Representative: **Negrini, Elena**
Agazzani & Associati S.r.l. & Studio Ing. Giampaolo Agazzani,
Via dell'Angelo Custode 11/6
40141 Bologna (IT)

(54) Refrigerated meat grinder

(57) A refrigerated meat grinder (100), provided with a hopper (2) for the feeding of meat to be minced, a mincing body (3) connected, by reducer means (5) and worm screw type transmission, to motor members (4) whose shaft (29) is vertical, includes cooling means (11) having a refrigeration compressor (6), condenser means, first (7) and second (8), evaporator means, first (9) and second (10), respectively fit for cooling the mincing body (3) and the hopper (2).

The refrigerated meat grinder (100) includes insulating means (12) fit to thermal insulate the hopper (2) and the mincing body (3).

FIG.1



EP 1 145 765 A1

Description

[0001] The present invention relates to meat processing apparatuses. Particularly the invention refers to a refrigerated meat grinder.

[0002] The known meat grinders essentially are provided with a feeding hopper for the meat to be minced, whose outlet engages the inlet manifold of a cylindrical body in which an helical screw pushes the meat against a rotating knife then through a bored disk that determines the meat calibration.

[0003] The screw is rotated by an electric motor by means of a gear mechanism for the motion transfer.

[0004] In order to limit the pouring of contained liquids in the meat there are meat grinder provided with a hopper having the bottom refrigerated: such meat grinders, however, do not fully meet the requirement to prevent the meat liquid pouring.

[0005] Besides said meat grinders do not assure the good meat preservation and maintenance especially during the phase of processing pause; in fact the meat or its residues, which are in the not refrigerated portions of said known meat grinders, are subject to temperature increases that facilitate the bacterial proliferation.

[0006] A further drawback of the known meat grinders consists in the fact that they are bulky mainly because of the motor members and the motion transfer members to the screw and the rotating blades of the cylindrical body.

[0007] The main object of the present invention is to propose a totally hygienic and sure meat grinder, which guarantees the bacteriostatic effect of the low temperatures due to the refrigeration of the all grinder members, contacted by the meat.

[0008] A further object is to reduce the pouring of the meat liquids. Other object is to propose a meat grinder having very small dimensions.

[0009] A further object of the present invention is to propose a meat grinder having a simple realization, low cost, high reliability and easy maintenance.

[0010] The purposes above described are achieved according to the content of the claims. The characteristics of the invention are underlined in the following with particular reference to attached drawings, in which:

- figure 1 shows a schematic side view of the meat grinder object of the present invention, in which some parts have been removed for better underlining other parts not shown;
- figure 2 shows a front view of the meat grinder of figure 1;
- figure 3 shows a side view of a variant of the meat grinder of the present invention.

[0011] With reference to figures 1 and 2, numeral 100 indicates the refrigerated meat grinder object of the present invention including a feeding hopper 2 of a mincing body 3 mechanically connected to the revolving speed reducer members 5 of the motor members 4. The meat grinder 100 has furthermore cooling means 11. These latter include connected in a closed loop a refrigeration compressor 6; condenser means first 7 and second 8; evaporator means first 9 and second 10 respectively fit to cool the mincing body 3 and the hopper 2. The connection between the elements of the cooling means 11 is made by means of refrigerating fluid ducts, not shown.

[0012] It is also provided that the connection of the evaporator means 9, 10 is reversed in the closed loop path.

[0013] The hopper 2 and the mincing body 3 are insulated by insulating means 12 including a thermal insulating material whose portion is indicated with the numeral 18.

[0014] The mincing body 3 includes a feeding duct 25 for the passage of the meat to be minced and a back portion 26 and a front portion 27, with respect to the outlet 30 of the minced meat, which contain a helical screw and a rotating knife moved by means of a shaft connected to the outlet of the reducer members 5. The reducer members 5 are constituted substantially by a worm reduction unit, connected to the shaft of the motor members 4 and pinion gear, connected to the shaft of the mincing body 3.

[0015] The shaft 29 of the motor members 4 is vertically positioned. It is important to notice that the vertical disposition of the motor members and the typology of the reducer members 5, allow to carry out an extremely compact meat grinder.

[0016] The first condenser means 7, connected whit the outlet of the compressor 6, include a coil contained in a tank 13 for the condensate of the evaporator means, first 9 and second 10. The heat of the first condenser means 7 causes the evaporation of condensate water.

[0017] The second condenser means 8 consist of a finned coil cooled by an air flow blown by fans 14.

[0018] The first evaporator means 9 are constituted substantially by a coil helically wound around the feeding duct 25, and the portions back 26 and front 27, of the mincing means 3.

[0019] In order to improve the thermal conduction between evaporator mean coils and the elements to be cooled it is provided the application, in the contact areas, of a thermo-conductive paste 31, for instance of silicone-type.

[0020] For guaranteeing the coils fixing to the mincing body 3, it is provided their wrapping in tapes or sheets of adhesive films, a portion thereof is indicated with the numeral 32, for instance aluminum adhesive tape.

[0021] The second evaporator means 10 includes a finned coil crossed by an airflow produced by second fans 15, for instance axial or tabential type. It is provided that the airflow can be inclined in comparison with the horizontal plane in order to generate a cooled air circu-

lation that licks up the wall of the hopper 2 therefore causing the cooling of the meat contained therein.

[0022] In the variant of figure 3, the second evaporator means 10 consist of a shaped duct, for instance with loops, indicated with the numeral 19. The shaped duct 19 expands on the lower surface of the hopper 2 and may extend to the side surface of this latter.

[0023] The shaped duct 19 adheres to the surface of the hopper 2 thanks to elastic means 16, for instance consisting of a layer of elastic synthetic material, fixed to a wall 17 which is positioned around the hopper 2 and has a thermal insulation 18.

[0024] Furthermore it is provided that the evaporator means first 9 and second 10 are carried out in a single body and are crossed by a airflow blown by the second fans 15 for the refrigeration of the hopper 2 and the mincing body 3.

[0025] It is also provided that the evaporator means first 9 and second 10 are coil shaped adherent to the mincing body 3 and to the hopper 2 supported by this latter by fixing means, for instance consisting of welded tabs. In this case the insulating means 12 consist of a thermal covering, for instance a spongy synthetic material in sheets or tape, adherently wrapped around the assembly composed by the second evaporator means 10, the hopper 2, the coil of the first evaporator means 9 and the mincing body 3 for thermally insulating these latter from the outside.

[0026] The operation of the meat grinder 100 is the same in all the described embodiments and provides the activation of the cooling means 11, the insertion of meat to be minced into the hopper and the activation of the motor members 4. The meat while remaining into the hopper 2 and crossing the mincing body 3, is kept cooled by virtue of the cooling means 11. The action of the helical screw and the rotating blades of the body 3, causes the expulsion of the minced meat.

[0027] The main advantage of the present invention is to provide a meat grinder whose members crossed by the meat are completely refrigerated and therefore have a sure and hygienic operation.

[0028] A further provided advantage is the reduction of the pouring of the meat liquids.

[0029] Other advantage is to provide a meat grinder having small dimensions.

[0030] Further advantage of the present invention is to provide a reliable meat grinder, having an easy installation and maintenance, and low cost.

Claims

1. Refrigerated meat grinder provided with a hopper (2) for the feeding of meat to be minced and a mincing body (3) and **characterized in that** includes:

   - motor members (4) having a vertical shaft (29) fit to move the mincing body (3);
   - reducer members (5) of the revolving speed of the motor members (4) interposed between these latter and the mincing body (3);
   - cooling means (11) including condenser means, first (7) and second (8), and evaporator means, first (9) and second (10), respectively fit to cool at least the mincing body (3) and the hopper (2);
   - a refrigeration compressor (6);
   - insulating means (12) for the thermal insulation of the hopper (2) and of the mincing body (3).

2. Meat grinder according to claim 1 **characterized in that** said reducer members (5) include a worm reduction unit.

3. Meat grinder according to claim 1 or claim 2 **characterized in that** the first evaporator means (9) are interposed between the second evaporator means (10) and the compressor (6) and are connected to the intake of this latter.

4. Meat grinder according to claim 1 or claim 2 **characterized in that** the second evaporator means (10) are interposed between the first evaporator means (9) and the compressor (6) and are connected to the intake of this latter.

5. Meat grinder according to any of the preceding claims **characterized in that** the first condenser means (7) include a coil contained in a tank (13) for the condensate of the evaporator means, first (9) and second (10).

6. Meat grinder according to any of the preceding claims **characterized in that** the second condenser means (8) consist in a coil cooled by an airflow blown by fans (14).

7. Meat grinder according to any of the preceding claims **characterized in that** the first evaporator means (9) include a coil wrapped around the mincing body (3) and at thermal flow communication with this latter for direct contact and/or by means of a thermo-conductive paste (31) interposed between the coil and the mincing body (3).

8. Meat grinder according to claim 7 **characterized in that** the coil of the first evaporator means (9) forms coils at least around a feeding duct (25), a back portion (26) and a front portion (27) of the mincing body (3).

9. Meat grinder according to claim 7 or claim 8 **characterized in that** the coil of the first evaporator means (9) is fixed to the mincing body (3) by means of adhesive films (32) that are also a protection for the thermo-conductive paste.

10. Meat grinder according to any of the preceding claims **characterized in that** the second evaporator means (10) include a coil crossed by an airflow produced by second fans (15) for cooling the hopper (2).

11. Meat grinder according to claims 1 and 10 **characterized in that** the insulating means (12) consist of an insulated container containing the evaporator means, first (9) and second (10), which are in a single body and are crossed by an airflow produced by the second fans (15) for refrigerating the hopper (2) and the mincing body (3).

12. Meat grinder according to claim 10 or claim 11 **characterized in that** the airflow produced by the second fans (15) is inclined with respect to the horizontal plane in order to generate a cooled air circulation that licks up the walls to be cooled.

13. Meat grinder according to any of the claims from 1 to 8 **characterized in that** the second evaporator means (10) include a shaped duct (19) which is fixed and extends on the lower surface of the hopper (2) with which said shaped duct (19) is in thermal flow communication for direct contact and thanks to a conductive paste 31.

14. Meat grinder according to claim 13 **characterized in that** the shaped duct (19) is also positioned on the side surface of the hopper (2).

15. Meat grinder according to claims 13 or 14 **characterized in that** the shaped duct (19) is clamped to the hopper (2) by elastic means (16) fixed to a containment wall (17) of the hopper (2) and having a thermal insulation (18).

16. Meat grinder according to claims 13 or 14 **characterized in that** the hopper (2) has fixing means of the shaped duct (19) and that the insulating means (12) consist of a thermal covering in contact with the second evaporator means (10), the hopper (2), the first evaporator means (9) and the mincing body (3) to thermally insulate these latter from the outside.

FIG.1

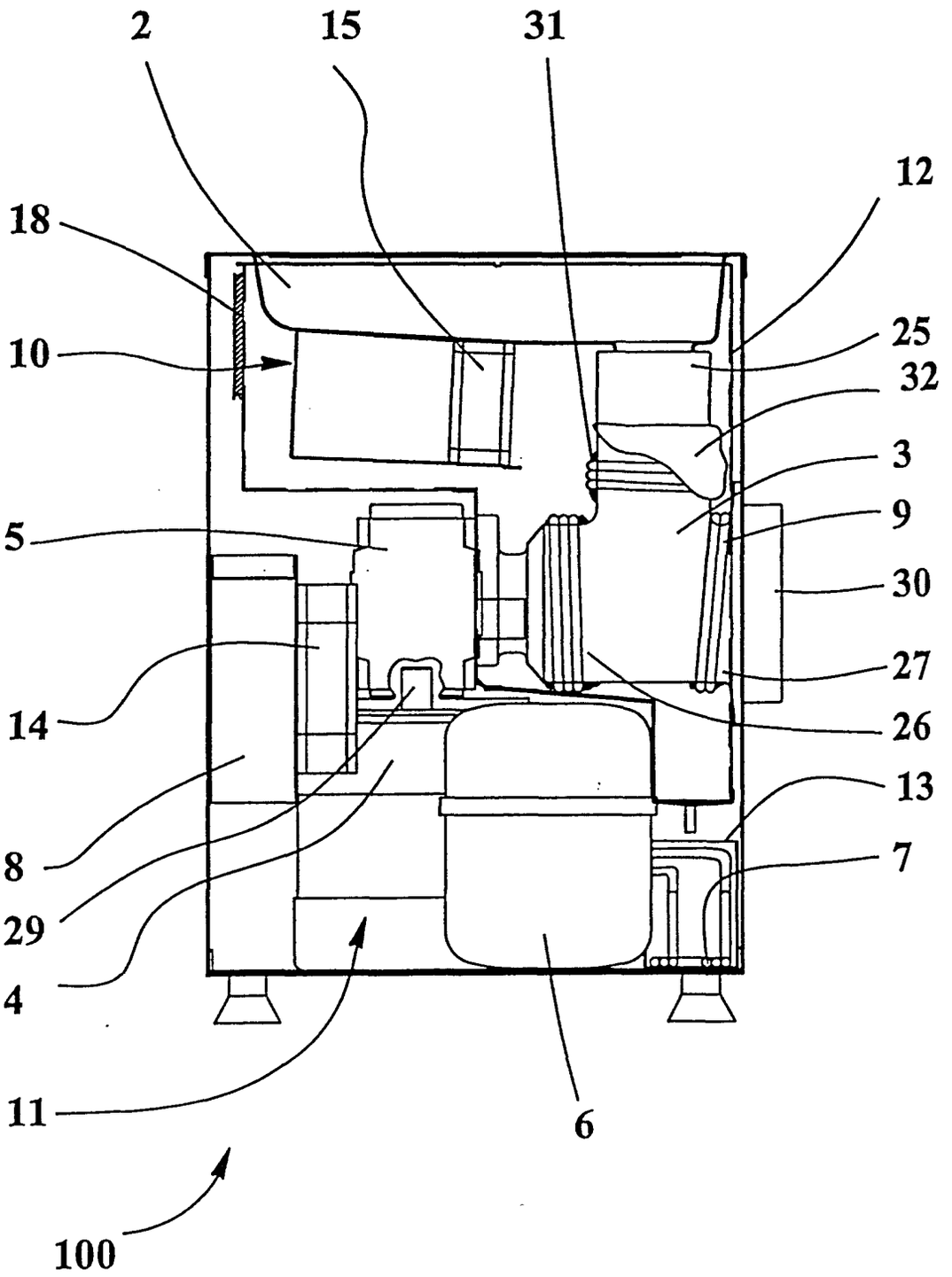


FIG.2

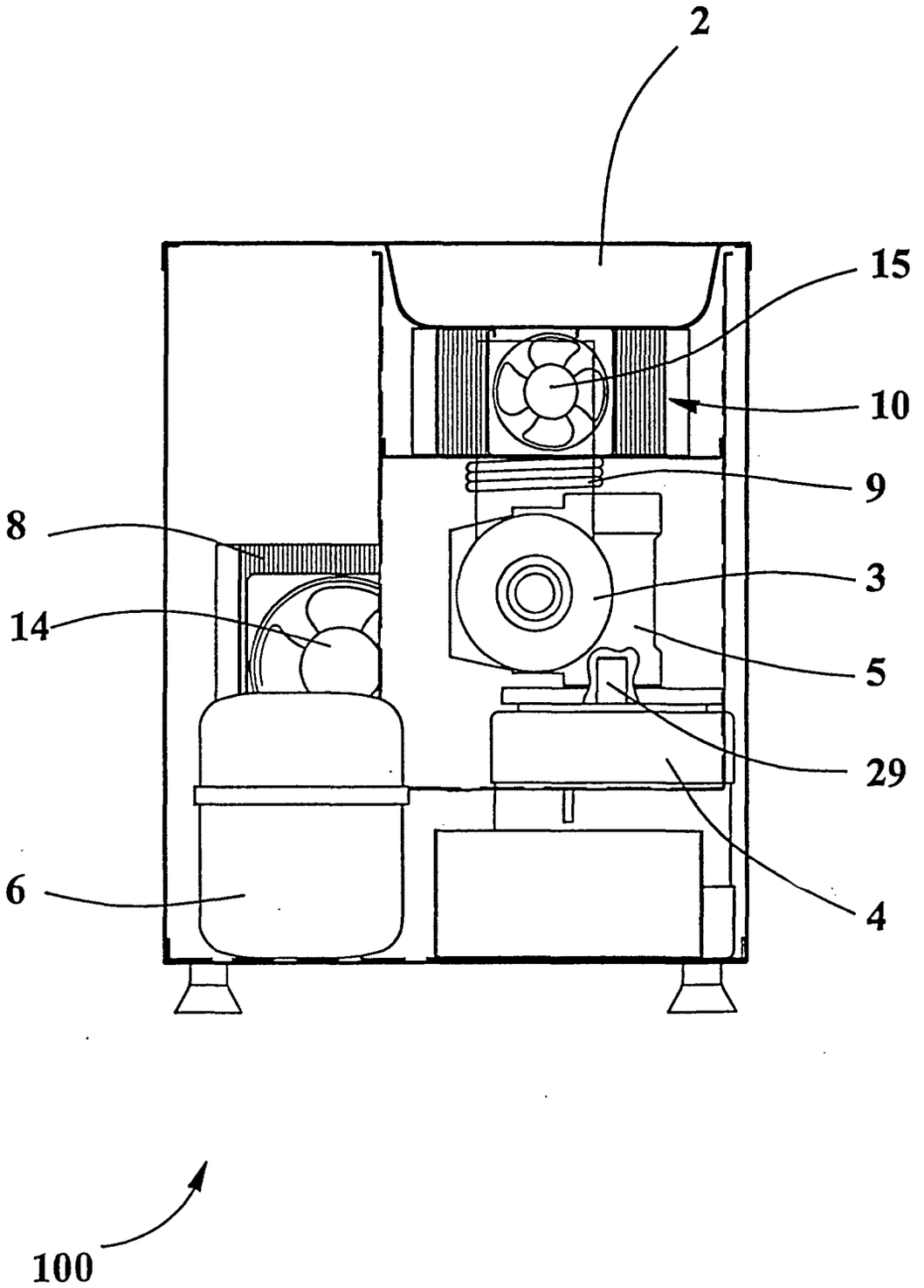
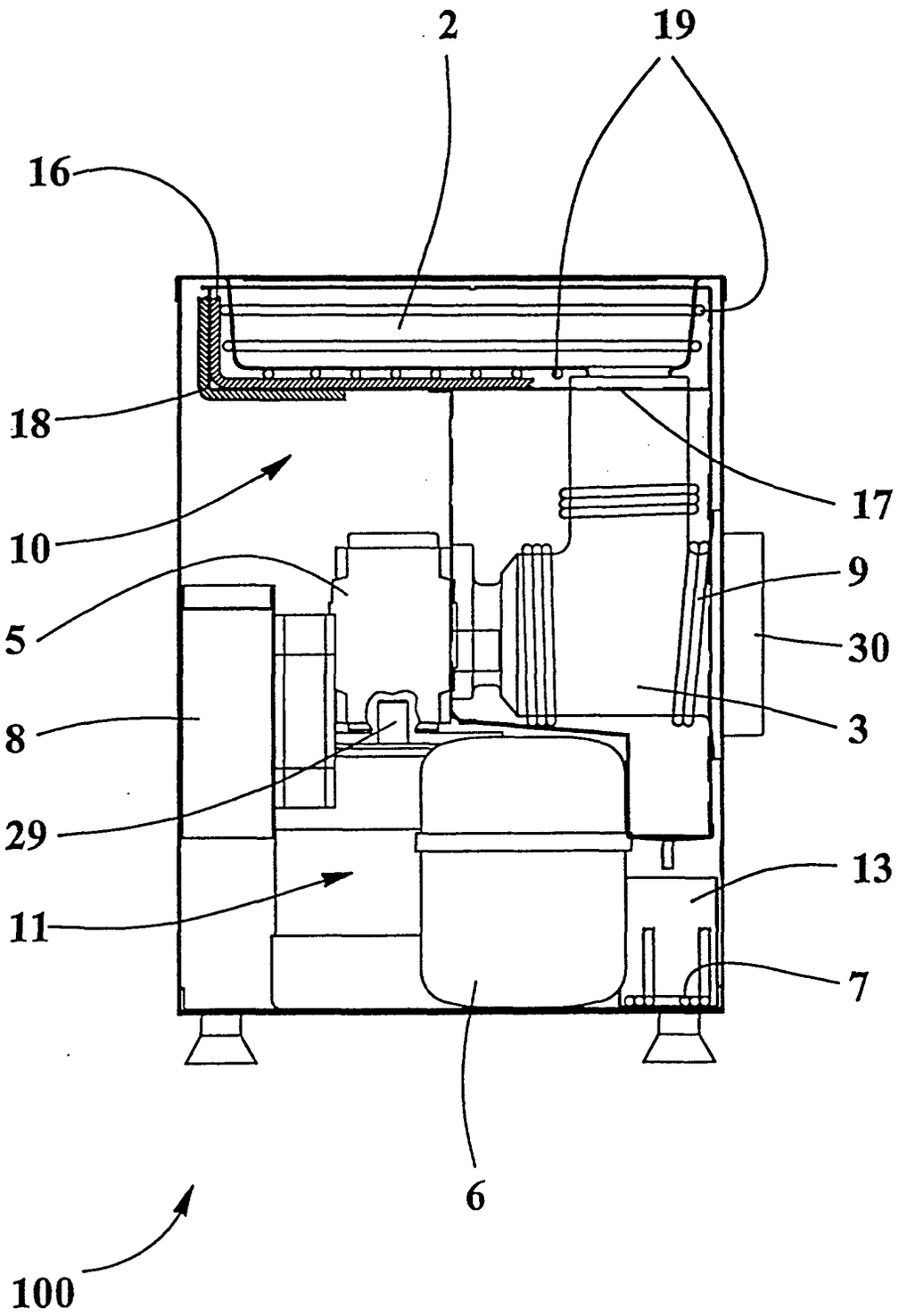


FIG.3



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 10 9113

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.7)
Y	FR 2 455 481 A (HELY JOLY GEORGES) 28 November 1980 (1980-11-28) * page 1, line 30 - page 2, line 32; figure 1 *	1-3	B02C18/30
A		4-13	
Y	DE 40 10 903 A (KAYSER GEORG DR) 11 October 1990 (1990-10-11) * column 2, line 5 - line 68 *	1,2	
A		3-13	
Y	GB 622 647 A (TOLEDO SCALE COMPANY) 5 May 1949 (1949-05-05) * page 1, line 28 - line 50; figures 3,4 *	1-3	
A	DE 91 03 705 U (MASCHINENFABRIK DORNHAM GMBH.) 23 July 1992 (1992-07-23) * the whole document *	1,2, 10-13	
A	FR 2 518 282 A (PATUREL MICHEL) 17 June 1983 (1983-06-17) * page 4, line 7 - page 5, line 8; figures 1-3 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B02C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	5 July 2001	Verdonck, J

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 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 01 10 9113

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-07-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2455481 A	28-11-1980	NONE	
DE 4010903 A	11-10-1990	DE 8904392 U	08-06-1989
GB 622647 A	05-05-1949	NONE	
DE 9103705 U	23-07-1992	NONE	
FR 2518282 A	17-06-1983	DE 3245414 A	23-06-1983
		DE 8234474 U	08-09-1983
		ES 518438 D	16-03-1984
		ES 8403634 A	16-06-1984
		IT 1155385 B	28-01-1987

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82