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(54) **VACUUM PACKAGING SYSTEM**

(57) A vacuum packaging system, comprising a first vacuum packaging machine (20) or "master" machine and a second vacuum packaging machine (12) or "slave" machine, wherein the first vacuum packaging machine (20) comprises a vacuum pump, at least a first sealing bar (27) and a first decompression chamber (24) inside which there is a suction unit (6), and the second vacuum packaging machine (12) has a tank (2) and a lid (4), which identify a second decompression chamber (3), and at least a second sealing bar (11). The second decompression-

chamber (3) of the second machine (12) is connected to the first machine (20) by means of a first pipe (5) connected, on one side, to the suction unit (6) of the first machine (20) and is inserted, on the other side, into the tank (2) of the second machine (12) and the second machine (12) is connected to the first machine (20) through an electrical connector (8) of the second machine (12) inserted into an electrical socket (7) of the first machine (20) and through a second pipe (10) connected to a fitting (9) of the first machine (20).

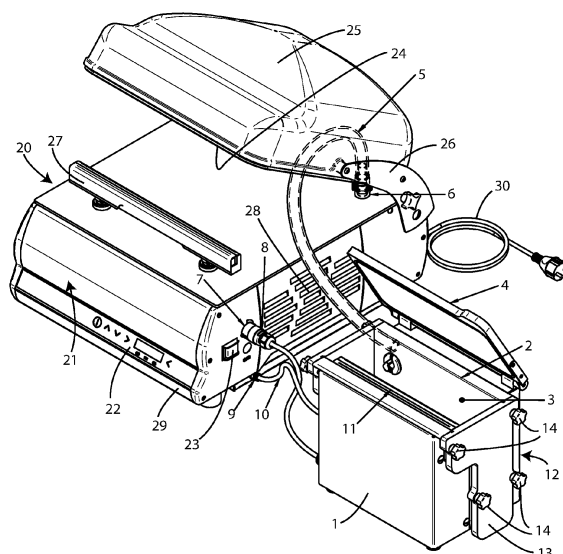


Fig. 1

Description

[0001] The present invention generally relates to a vacuum packaging system.

[0002] More in detail, the invention relates to a vacuum packaging system comprising a "master" packaging machine that is suitably arranged to be connected to a decompression chamber with fixed or removable sides; thus, it is possible to speed up vacuum packaging operations and treat both solid and liquid products in less time than the prior art and in successive stages with each other.

[0003] According to the prior art, in general, packaging using vacuum packaging machines is done by introducing the product to be packaged inside a plastic bag or vessel suitable for vacuum packaging and placing the bag containing the product inside a decompression chamber consisting of a tank and a tilting bell or lid comprising elements suitable for sealing the bag or vessel and maintaining the vacuum inside that tank.

[0004] Closing the tilting bell or lid on the tank then starts a vacuum cycle by means of a pump.

[0005] At the end of the cycle, when the residual pressure inside the vacuum chamber reaches 1 or 2 mbar absolute, sealing of the bag containing the product is carried out using the same pressure difference between the inside of the decompression chamber and the atmosphere through membranes connected to the sealing bars of the tilting bell or lid and to a solenoid valve.

[0006] Once the sealing phase is complete, atmospheric air enters the decompression chamber, and the atmospheric pressure allows the bag to fully adhere to the packaged product while ensuring that the package is sealed.

[0007] In fact, if the package were to be opened or damaged, the bag would no longer be found to adhere to the packaged product, thus alerting the eventual purchaser of the product.

[0008] Not only solid foods, but also beverages and liquid foods (such as beverages, creams, soups, and sauces) can be packaged with vacuum packaging machines to ensure that the product maintains its qualities over time.

[0009] Almost all machines, moreover, have special platforms that, if applied, allow standard use of the machine, which can therefore also be used to vacuum packaging normal quantities of product.

[0010] However, the types of machines known allow for the individual handling of products, and this drawback results in slowing down and inconvenience of packaging operations, especially when significant quantities of diverse products must be prepared, as in the case of large-scale catering. Therefore, the aim of the present invention is to overcome the technical inconveniences mentioned above and, in particular, it is to realize a vacuum packaging system, which allows speeding up the vacuum packaging operations, compared to the prior art, and which allows handling both solid and liquid products with

a single packaging device.

[0011] Another aim of the invention is to realize a vacuum packaging system, which is extremely reliable, simple and economical, compared with the benefits achieved.

[0012] These and other aims are achieved by means of a vacuum packaging system, according to the attached claim 1; other detailed features are given in subsequent claims.

[0013] Further aims and advantages of the present invention will be clear from the following description of illustrative and preferred, but not limiting embodiments and the attached drawings, wherein:

- Figure 1 schematically shows a vacuum packaging system according to a first embodiment of the present invention;
- Figure 2 schematically shows a vacuum packaging system according to a further embodiment of the present invention.

[0014] With reference to the attached figures, the vacuum packaging system, which is the object of the present invention, comprises a first vacuum packaging machine 20, of the "master" type, having a power supply cable 30 to the power supply line, a support and containment structure 21, having a front control panel 22 and a power button 23, and a further vacuum packaging machine 12, of the "slave" type, having an outer chamber 1 comprising a tank 2 and a lid or bell 4.

[0015] The "master" vacuum packaging machine 20 and the "slave" vacuum packaging machine 12 can be indifferently suitable for packaging solid and/or liquid products.

[0016] The structure 21 of the "master" machine 20 is adapted to support the functional components of the machine 20, such as, in particular, a vacuum pump, and also comprises a base frame 29, which can be opened frontally to have access to the functional components of the machine 20 and is equipped with cooling slits 28. The base frame 29 can be kept in the open position by means of a spacer.

[0017] Advantageously, the support and containment structure 21 of the "master" machine 20 comprises a decompression chamber 24 for vacuum packing a product inside a plastic bag or other suitable container.

[0018] Still advantageously, the decompression chamber 24 comprises a tank covered by a tilting bell 25, possibly equipped with extenders 26 for easy opening and suitable for sealing the open edges of the bag by means of perimeter sealing bars 27.

[0019] The tank 2 and the lid 4 of the "slave" machine 12 identify an internal decompression chamber for vacuum packaging a product, for example inside a plastic bag or other suitable container, by means of a sealing bar 11.

[0020] Decompression chamber 3 may have fixed sides, or it may have one or more shaped, removable

inserts 13 that are fixed in a position corresponding to tank 2 by means of screws and/or knobs 14.

[0021] In the case of removable inserts 13, the inserts are held in place by at least one gasket (not shown in the figure) placed in a seat of each insert 13 in at least a portion of the cross-sectional perimeter of the tank 2.

[0022] The gasket provides a watertight seal on the tank 2 and superiorly the lid 4 makes a seal on the tank 2.

[0023] The use of the removable inserts 13 on the side panels of the "slave" packaging machine 12 enables an effective cleaning of the tank 2 to be carried out, in a simple and convenient manner, by simply removing and reattaching such inserts 13.

[0024] According to the invention, the decompression chamber 3 of the "slave" packaging machine 12 is connected to the "master" packaging machine 20 following an appropriate arrangement of the latter.

[0025] In particular, a first pipe 5 is used, which is connected on one side to a suction unit 6 present inside the decompression chamber 24 of the "master" packaging machine 20 and is inserted, on the other side, inside the tank 2 of the machine 12.

[0026] In addition, an electrical connector 8 of the packaging machine 12 is connected to an electrical socket 7 made on the structure 21 of the "master" packaging machine 20 and a second pipe 10 of the "slave" machine 12 is connected to a fitting 9 of the "master" machine 20.

[0027] In this way, by operating the "master" machine 20, a vacuum is created not in the tilting bell 25, but in the decompression chamber 3 of the "slave" packaging machine 12 where then, by means of the sealing bar 11, it is possible to seal a containment bag and vacuum pack the product.

[0028] By deactivating the electrical connection and pipes 5, 10 of the "slave" packaging machine 12, it is still possible to use the single "master" machine 20 for vacuum packaging.

[0029] Ultimately, the use of such a packaging system makes it possible to package solid and liquid products simply by employing a single packaging unit and activating or deactivating the "slave" packaging machine 12, via connectors 8 and pipes 5 and 10, without having to arrange and prepare each machine individually.

[0030] In addition, the system provides significant savings because all functions are performed using a single vacuum pump (preferably installed inside the "master" machine 20).

[0031] From the description made, the technical characteristics of the vacuum packaging system, which is the object of the present invention, are clear, as are its advantages.

[0032] Finally, it is clear that a preferred embodiment of the present invention has been described in the foregoing, but it is to be understood that person skilled in the art may make modifications and changes without thereby departing from the relevant scope of protection as defined by the appended claims.

Claims

1. Vacuum packaging system, comprising a first vacuum packaging machine (20) or "master" machine, which is configured to package solid or liquid products, and a second vacuum packaging machine (12) or "slave" machine, which is also configured to package solid or liquid products, wherein said first vacuum packaging machine (20) comprises a vacuum pump, at least a first sealing bar (27) and a first decompression chamber (24) inside which there is a suction unit (6), and said second vacuum packaging machine (12) has a tank (2) and a lid (4), which identify a second decompression chamber (3), and at least a second sealing bar (11), **characterized in that** said second decompression chamber (3) of said second machine (12) is connected to said first machine (20) by means of a first pipe (5) and said first pipe (5) is connected, on one side, to said suction unit (6) of said first machine (20) and is inserted, on the other side, into said tank (2) of said second machine (12), said second machine (12) being connected to said first machine (20) through an electrical connector (8) of the second machine (12) which is inserted into an electrical socket (7) of said first machine (20) and through a second pipe (10) which is inserted into a fitting (9) of said first machine (20).
2. Vacuum packaging system as claimed in claim 1, **characterized in that** said first machine (20) has a support and containment structure (21) and a base frame (29) equipped with cooling slits (28).
3. Vacuum packaging system as claimed in claim 2, **characterized in that** said support and containment structure (21) of said first machine (20) includes said first decompression chamber (24), said first decompression chamber (24) comprising a tank covered with a tilting bell (25) and perimeter sealing bars (27).
4. Vacuum packaging system as claimed in at least one of the preceding claims, **characterized in that** said first machine (20) and / or said second machine (12) has fixed or removable side panels.
5. Vacuum packaging system as claimed in claim 4, **characterized in that** said removable side panels comprise one or more shaped and removable lateral inserts (13), which are fixed in a position corresponding to said tank (2) by means of screws and / or knobs (14).
6. Vacuum packaging system as claimed in claim 5, **characterized in that** said removable inserts (13) are kept in position and kept watertight by at least one gasket placed in a seat of each insert (13) and in correspondence with at least a portion of the perimeter of said tank (2).

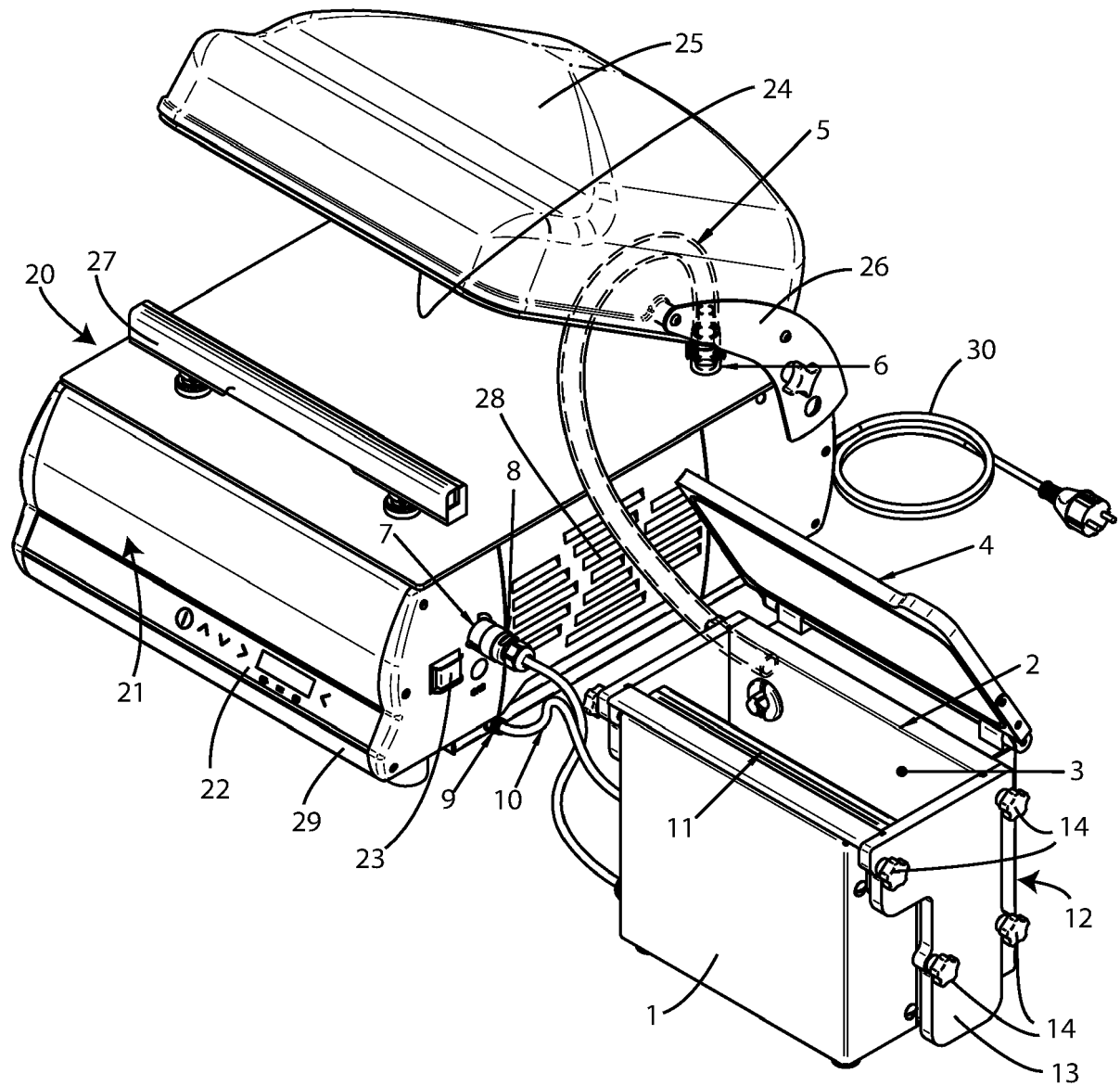


Fig. 1

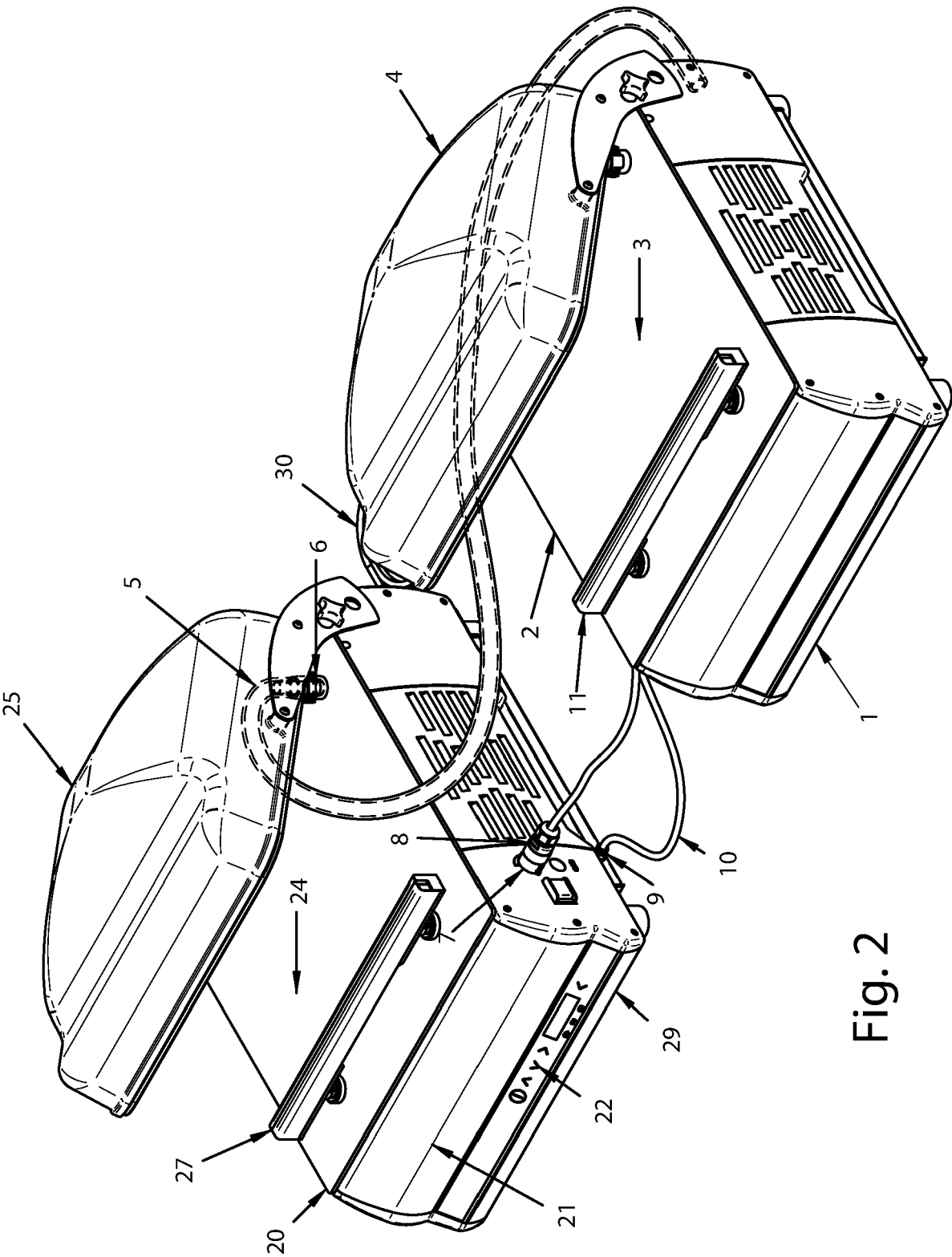


Fig. 2



EUROPEAN SEARCH REPORT

Application Number

EP 22 18 7482

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EPO FORM 1503 03.82 (P04C01)

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 30 November 2022	Examiner Cardoso, Victor
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	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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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
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