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(54) **Method for packaging products with heat-shrinking film**

Verfahren zum Verpacken von Produkten mit heissschrumpfender Folie

Procédé pour emballer des produits dans un film thermorétractable

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Description

[0001] The present invention refers to a procedure for packaging small products with heat-shrinking film on an energy-saving packager.

[0002] Machines for packaging products with centre-folded heat-shrinking film have a dome hinged onto a structure to form a heat-shrinking chamber, equipped with a heat source and a fan for circulating the heated air. A cutting and sealing frame, equipped with a blade or sealing rods is applied integral with the edges of the dome.

[0003] The procedure foresees that an operator place the products to be packaged on a support surface inside the chamber between two flaps of a film folded upon itself in the longitudinal direction, known as "centre-folded film". The lowering of the dome determines the action of the blade or sealing rods on the film to form an encasement closed around the product. The subsequent activation of the heat source and of the fan determines the heat-shrinking of the film on the product. The packaging operations follow on for each product in the same way as that which is described.

[0004] Such machines, having to adapt to products of various sizes, must be of a suitable volume and have ventilation and heating capabilities which are suitable for large products and are therefore oversized in the case of the packaging of small products.

[0005] An energy-saving packaging machine foresees the realisation of a heat-shrinking chamber which can be divided through a mobile dividing wall, where each of the zones which are formed is arranged with a heat source and a fan for circulating air which are independent and can be selectively activated.

[0006] In the case of packaging small products, the heat-shrinking will take place in just one zone, defined by the dividing wall; in the case of treatment of large products, on the other hand, the entire volume of the dome shall be used with the simultaneous activation of both fans and both heat sources.

[0007] The main drawback of the conventional use of packaging machines with a dome consists of the high energy consumption, in the form of heat dispersion, which cannot be avoided each time the dome is opened.

[0008] Moreover, this use produces working conditions which are very dangerous for the operator, who, for each packaging product, is run over a great mass of hot air.

[0009] The general purpose of the present invention is that of overcoming the aforementioned drawbacks of the prior art in an extremely simple, cost-effective and particularly functional manner.

[0010] Another purpose is that of improving the heat-shrinking of film with low heat-absorption capability or with a greater thickness.

[0011] In view of the aforementioned purposes, according to the present invention, it has been thought of to realise a procedure for packaging with heat-shrinking film, having the characteristics outlined in the attached claims.

[0012] The structural and functional characteristics of the present invention and its advantages compared to the prior art shall become even clearer from an examination of the following description, referring to the attached drawings, which show a procedure realised according to the innovative principles of the invention itself.

[0013] In the drawings:

- figure 1 is a side elevation section view which longitudinally shows a machine for packaging with heat-shrinking film which can be used in a possible non-exclusive embodiment of the present invention;
- figure 2 is a cross-section rotated by 90° with respect to the previous view of figure 1;
- figure 3 is plan view from above of the machine of figure 1;
- figures 4a-4c schematically show the steps of a packaging procedure, object of the present invention, carried out on the machine of figure 1, according to a first embodiment;
- figures 5a-5d schematically show the steps of a second embodiment of a packaging procedure, object of the present invention;
- figures 6a-6e schematically show the steps of a third embodiment of a packaging procedure.

[0014] With reference to the drawings, with 10 an energy-saving machine for packaging products with heat-shrinking film is wholly indicated, comprising a structure 11 upon which a reel of heat-shrinking film 14 is fitted and upon which for example the procedure according to the invention is carried out.

[0015] The packaging machine 10 consists of a cover 13 or dome, equipped with cutting and sealing means, such as a blade or sealing rods, which fits onto a lower part 11, hinged at 16 along one of its sides, and defines a heat-shrinking chamber 15.

[0016] In the chamber a dividing wall is arranged, formed from an upper portion 17, integral with the dome 13, and a lower portion 18, inserted into the structure 11. Such portions of wall 17 and 18 can be both of the removable type or they can be generically mobile.

[0017] In this way the chamber 15 is divided into two separate zones A and B, which can be used independently, thanks to a sensor 19, which detects the presence or non-presence of the wall 18.

[0018] Each zone A and B is equipped with a heat source, resistors 21A and 21B, and with a fan 20A and 20B for circulating the heated air, as well as with a support surface 22A and 22B, for example a gridded surface, for products to be packaged 23. Such a support surface 22A and 22B can be of the type which can be adjusted in height, to allow the chamber 15 to also be divided in the vertical direction.

[0019] Moreover, in a different embodiment which is not shown in the figures, the support surface 22A and 22B of the machine 10 also has the function of transporting the products 23 into such a machine 10 and of discharging them out from it and is made up of a transportation device for example a conveyor belt or else rollers.

[0020] The procedure for packaging small products with heat-shrinking film 14 foresees the preparation of many products for every work cycle. By work cycle we mean all of the packaging operations carried out in succession on a number of products, which can be received simultaneously in the chamber 15 during heat-shrinking. In the subsequent descriptions of the procedure the products packaged in a work cycle shall be indicated with I, II, III, IV; those packaged in the subsequent cycles shall be indicated with I', II' and so on.

[0021] The number of products packaged for each work cycle is at least equal to two and the maximum depends upon the sizes of the products themselves, as well as upon the capacity of the chamber 15.

[0022] A first embodiment of the procedure, object of the present invention, is carried out with the dividing wall 18 in closed position to separate the chamber 15 into the two zones A and B. In zone A the sealing operations of products I and II are carried out in succession between the sealing rods (figures 4a-4c).

[0023] Each time the dome 13 is opened, the product I or II, enclosed by a closed encasement, is transferred into zone B (figures 4b and 4c). The work cycle ends with the heat-shrinking of all of the products present in zone B, through the activation of the fan 20B and of the heat source 21B (figure 4c). Possibly, as indicated in the figures, at the same time as the heat-shrinking, the sealing of the first product I' of the subsequent work cycle takes place in zone A.

[0024] The embodiments described hereafter allow more than one heat-shrinking operation to be carried out for each product being treated, which is desirable in order to improve the heat-shrinking of film with low heat-absorption capability or with an increased thickness. The second embodiment of the procedure foresees the operation of the machine 10 with the dividing wall 18 closed. In each work cycle in zone A the sealed products I and II of figures 5a and 5b accumulate, which are then transferred simultaneously into zone B (figure 5c). Then many heat-shrinking operations, up to a maximum equal to the number of products packaged in every work cycle, are carried out. Such heat-shrinking operations (figures 5c and 5d) coincide with the sealing operations in zone A of the products of the subsequent cycle I' and II' and therefore are interrupted by the opening of the dome 13.

[0025] Finally, in a final embodiment of the procedure the machine 10 functions with the dividing wall 18 closed and each sealing operation in zone A also corresponds to the actuation of the fan 20B and of the heat source 21B (figures 6c-6e). Figures 6a and 6b, on the other hand, represent a transitory start-up step of the machine 10. The products being treated I, II, I', II', I" are transferred, for example through a non-shown automated transporter, into a series of contiguous successive positions and are discharged one at a time from zone B.

[0026] The operation of the chamber according to the described procedures can be programmed by the operator and is carried out step-by-step according to an automated sequence.

[0027] From that which is described above with reference to the figures is clear how a procedure for packaging small products with heat-shrinking film on an energy-saving packager, according to the invention, is particularly useful and advantageous. Such a procedure, indeed, guarantees an increase in productivity, as well as a good shrinking of the film on the products with a substantial saving in energy.

[0028] The purpose mentioned in the preamble of the description is thus achieved.

Claims

1. Procedure for packaging small products with heat-shrinking film on an energy-saving packager (10) consisting of a cover (13) or dome, equipped with cutting and sealing means, such as a blade or sealing rods, which fits onto a lower part (11), to define a chamber (15), said cutting and sealing means being effective in providing an encasement around each individual product by cutting a centre-folded film into an appreciate shape and sealing the edges of the film to form said encasement, were said chamber (15) foresees a dividing wall (17, 18) to define at least two separate zones (A, B), equipped with at least one heat source (21A, 21B) and with a fan (20A, 20B) for circulating the heated air and with a support surface (22A, 22B) for products to be packaged (23), **characterised in that** it foresees for every work cycle the packaging of a number of products (I, II, III, IV, I', II') at least equal to two and at most equal to the number of products which can simultaneously be received in said chamber (15, A, B), where said work cycle comprises:

   - a number of subsequent cutting and sealing operations in a first zone (A) equal to the number of products (I, II, III, IV) to be packaged;
   - at least one heat-shrinking operation of said products (I, II, III, IV) arranged in a second zone (B) through the activation of said fans (20A, 20B) and of said heat sources (21A, 21B),

   wherein at time same time as said heat-shrinking operation in said second one (B) the sealing in said first zone (A) of a first product (I') of the next work cycle takes place.

2. Procedure according to claim 1, **characterised in**

that said at least one heat-shrinking operation is just one in number and is carried out in said zone (B) with said dividing wall (18) in closed position.

3. Procedure according to claim 1, **characterised in that** said at least one heat-shrinking operation are equal in number to the products to be packaged (I, II, III, IV) for each work cycle.

4. Procedure according to claim 1, **characterised in that** said products to be packaged (I, II, III, IV), are transferred in an automated manner, said support surface (22A, 22B) consisting of a transporter.

Patentansprüche

1. Verfahren zum Verpacken kleiner Produkte mit Wärmeschrumpffolie an einer Energie sparenden Verpackungsvorrichtung (10), die aus einer Abdekkung (13) oder Kuppel besteht, die mit einem Schneide- und Abdichtmittel, wie einer Klinge oder Abdichtstäben, ausgerüstet ist und auf einen unteren Teil (11) passt, um eine Kammer (15) zu definieren, wobei das Schneideund Abdichtmittel dazu dient, eine Umhüllung um jedes einzelne Produkt bereitzustellen, indem eine Mittelfalzfolie zu einer geeigneten Form geschnitten wird und die Kanten der Folie abgedichtet werden, um die Umhüllung zu bilden, wobei an der Kammer (15) eine Trennwand (17, 18) vorgesehen ist, um zumindest zwei separate Bereiche (A, B) zu definieren, die mit mindestens einer Wärmequelle (21A, 21B) und mit einem Gebläse (20A, 20B), um die erwärmte Luft zirkulieren zu lassen, und mit einer Unterstützungsfläche (22A, 22B) für zu verpackende Produkte (23) ausgestattet sind, **dadurch gekennzeichnet, dass** es für jeden Arbeitstakt das Verpacken einer Anzahl von Produkten (I, II, III, IV, I', II') von zumindest gleich zwei und höchstens gleich der Anzahl von Produkten, die gleichzeitig in der Kammer (15, A, B) aufgenommen werden können, vorsieht, wobei der Arbeitstakt umfasst:

   - eine Anzahl von aufeinander folgenden Schneide- und Abdichtarbeitsgängen in dem ersten Bereich (A) gleich der Anzahl von zu verpackenden Produkten (I, II, III, IV);
   - zumindest einen Wärmeschrumpfarbeitsgang der Produkte (I, II, III, IV), die in einem zweiten Bereich (B) angeordnet sind, über die Aktivierung der Gebläse (20A, 20B) und der Wärmequellen (21A, 21B), wobei gleichzeitig mit dem Wärmeschrumpfarbeitsgang in dem zweiten Bereich (B) in dem ersten Bereich (A) das Abdichten von einem ersten Produkt (I') des nächsten Arbeitstaktes stattfindet.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der zumindest eine Wärmeschrumpfarbeitsgang gerade ein einziger ist und in dem Bereich (B) ausgeführt wird, wobei die Trennwand (18) sich in einer geschlossenen Stellung befindet.

3. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der zumindest eine Wärmeschrumpfarbeitsgang in einer gleichen Anzahl wie die zu verpackenden Produkte (I, II, III, IV) für jeden Arbeitstakt erfolgt.

4. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die zu verpackenden Produkte (I, II, III, IV) auf eine automatische Weise überführt werden, wobei die Unterstützungsfläche (22A, 22B) aus einer Fördereinrichtung besteht.

Revendications

1. Procédure d'emballage de petits produits avec un film thermorétractile sur un emballeur (10) permettant d'économiser de l'énergie constitué d'un couvercle (13) ou d'un dôme, équipé de moyens de découpage et de fermeture, tels qu'une lame ou des barres de fermeture, qui sont installés sur une partie inférieure (11), pour définir une chambre (15), lesdits moyens de découpage et de fermeture servant à fournir une enveloppe autour de chaque produit individuel en découpant un film plié au centre selon une forme appropriée et en refermant les bords du film pour former ladite enveloppe, dans laquelle ladite chambre (15) prévoit une cloison (17, 18) pour définir au moins deux zones séparées (A, B), équipées d'au moins une source de chaleur (21A, 21B) et d'un ventilateur (20A, 20B) destiné à faire circuler l'air chauffé et d'une surface de support (22A, 22B) pour les produits destinés à être emballés (23), **caractérisée en ce qu'**elle prévoit pour chaque cycle de travail l'emballage d'un certain nombre de produits (I, II, III, IV, I', II') au moins égal à deux et au moins égal au nombre de produits qui peuvent être reçus simultanément dans ladite chambre (15, A, B), dans laquelle ledit cycle de travail comprend :

   - un certain nombre d'opérations de découpage et de fermeture subséquentes dans une première zone (A) égal au nombre de produits (I, II, III, IV) destinés à être emballés ;
   - au moins une opération de thermorétraction desdits produits (I, II, III, IV) agencés dans une seconde zone (B) par l'activation desdits ventilateurs (20A, 20B) et d'une desdites sources de chaleur (21A, 21B), dans laquelle en même temps que ladite opération de thermorétraction dans ladite seconde zone (B), la fermeture

dans ladite première zone (A) d'un premier produit (I') du prochain cycle de travail a lieu.

2. Procédure selon la revendication 1, **caractérisée en ce que** ladite au moins une opération de thermorétraction est seulement de une en nombre et est réalisée dans ladite zone (B) avec ladite cloison (18) dans la position fermée.

3. Procédure selon la revendication 1, **caractérisée en ce que** ladite au moins une opération de thermorétraction est égale en nombre aux produits destinés à être emballés (I, II, III, IV) pour chaque cycle de travail.

4. Procédure selon la revendication 1, **caractérisée en ce que** lesdits produits destinés à être emballés (I, II, III, IV) sont transférés d'une manière automatisée, ladite surface de support (22A, 22B) consistant en un mécanisme de transport.

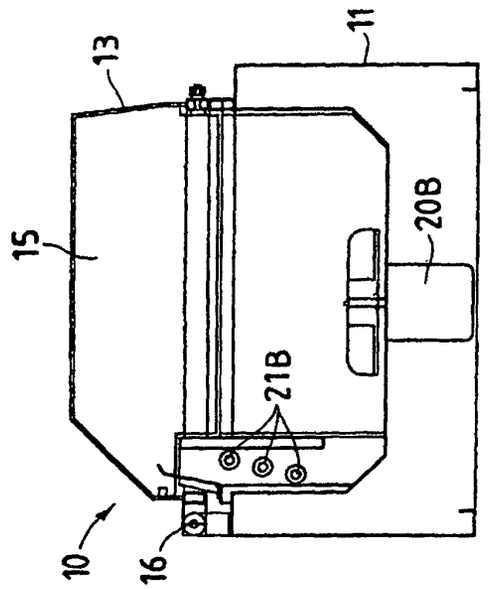

Fig.2

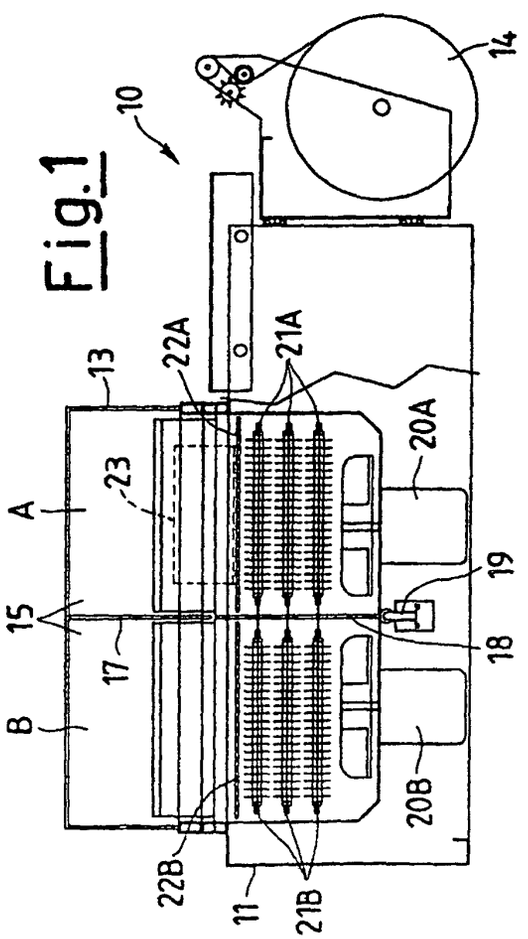

Fig.1

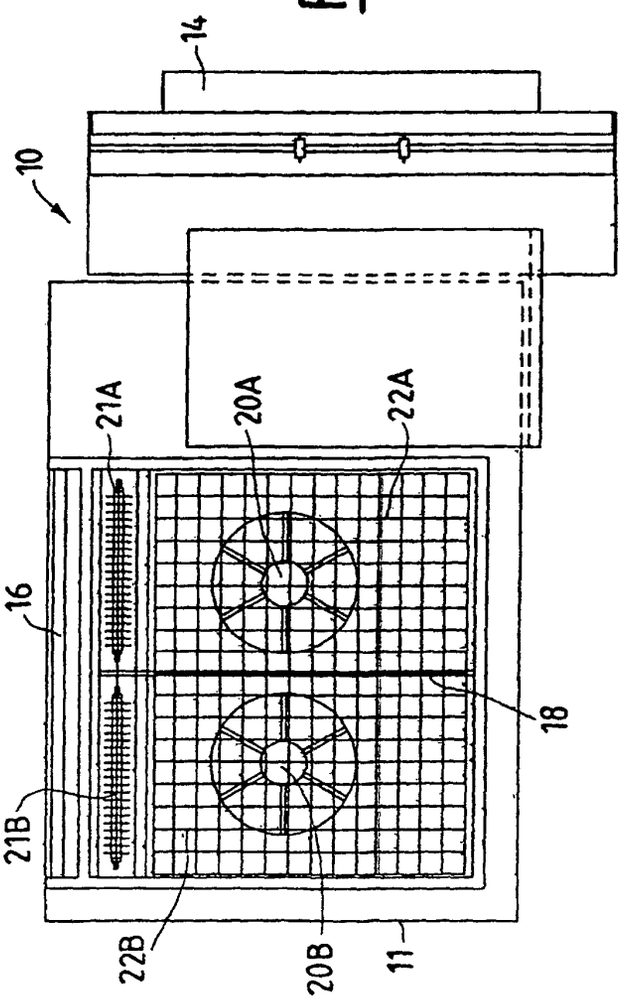

Fig.3

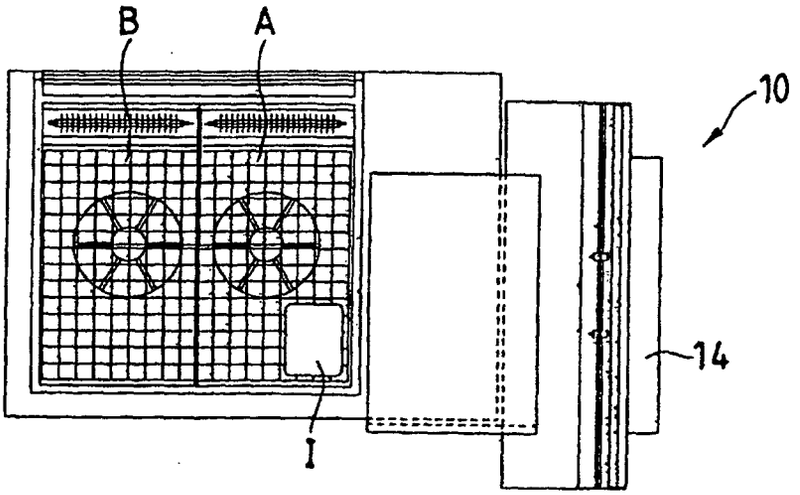

Fig.4a

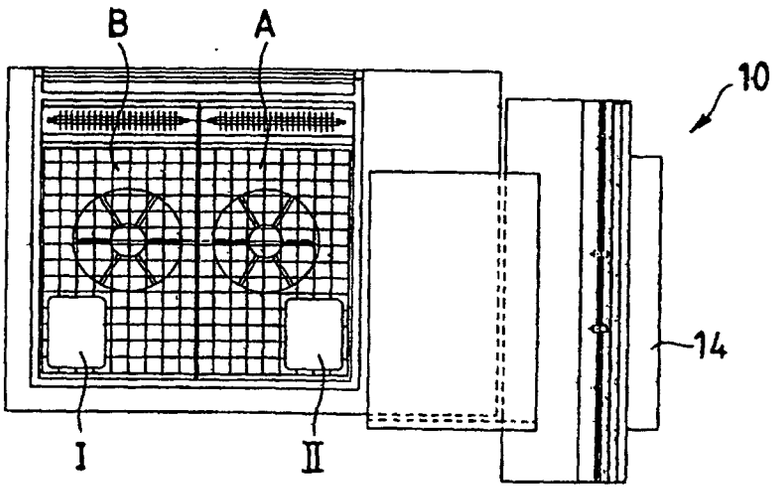

Fig.4b

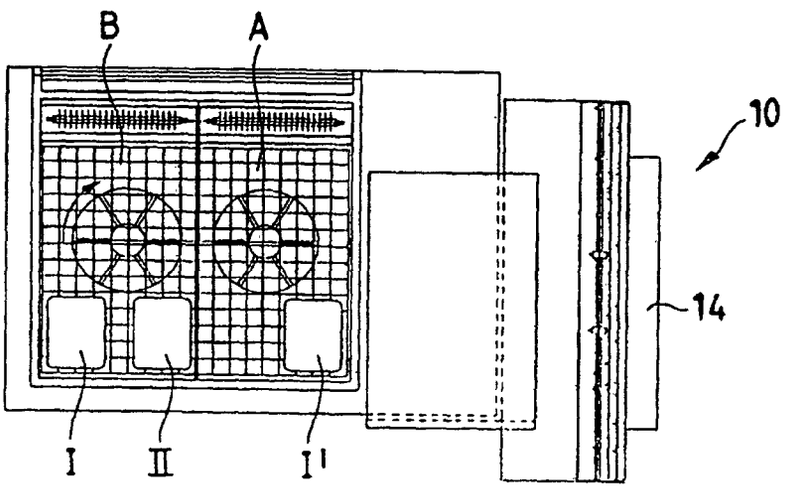

Fig.4c

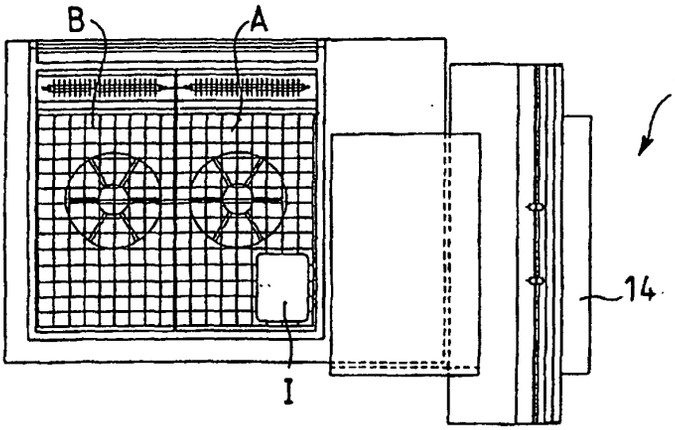

Fig.5a

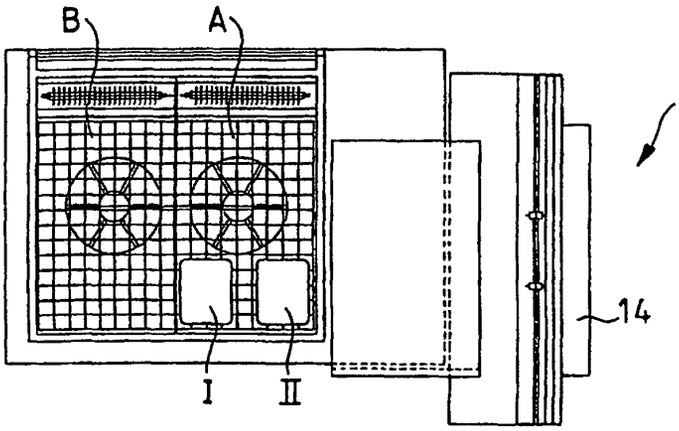

Fig.5b

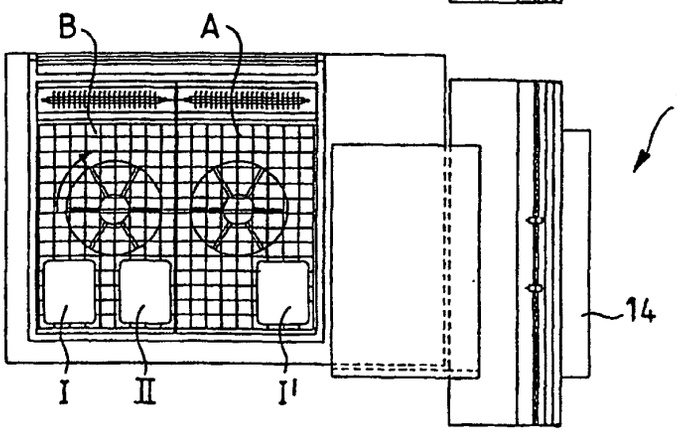

Fig.5c

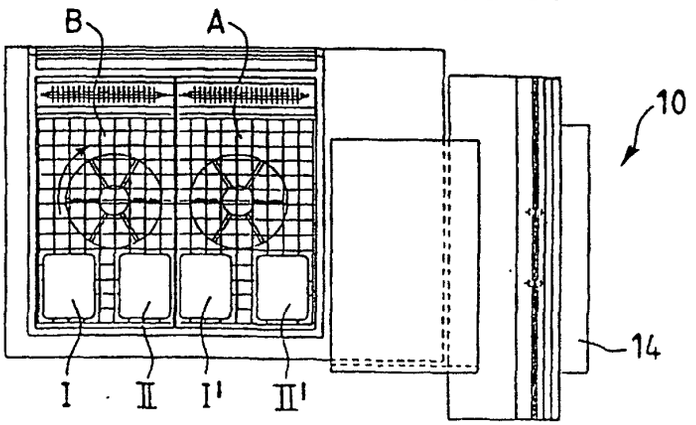

Fig.5d

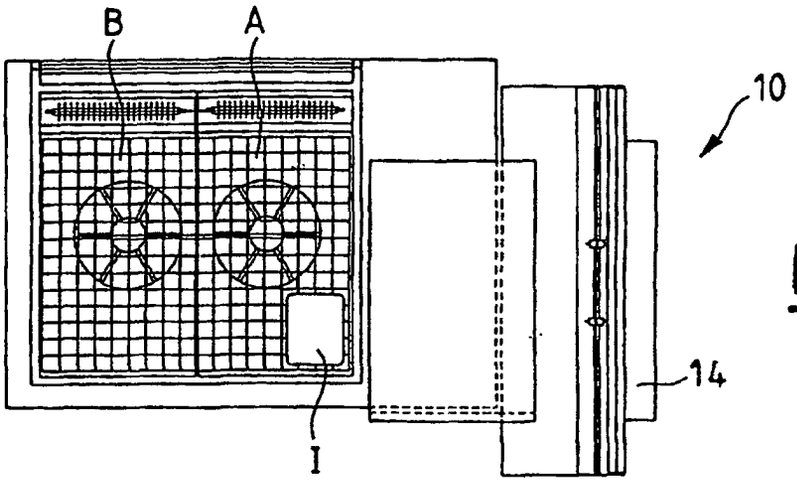

Fig.6a

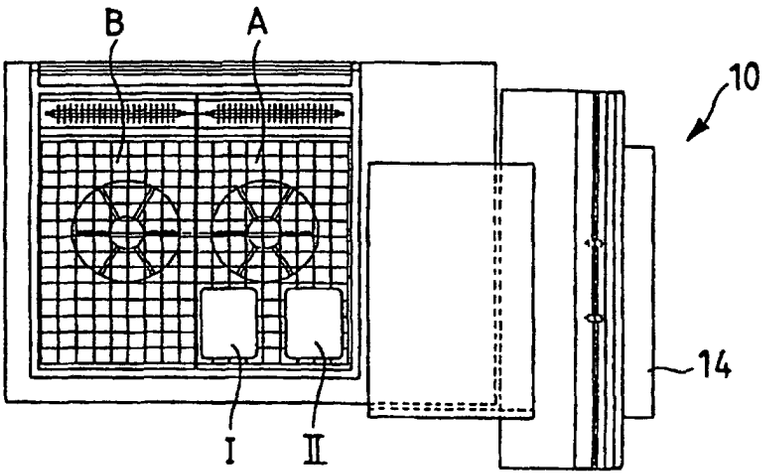

Fig.6b

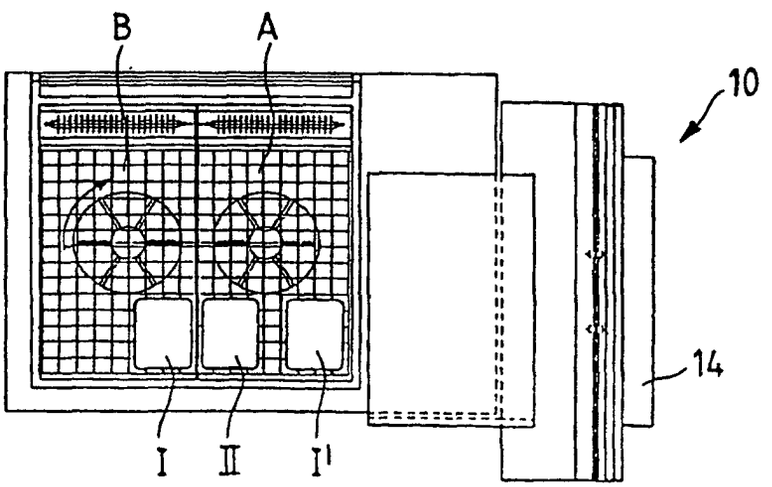

Fig.6c

Fig.6d

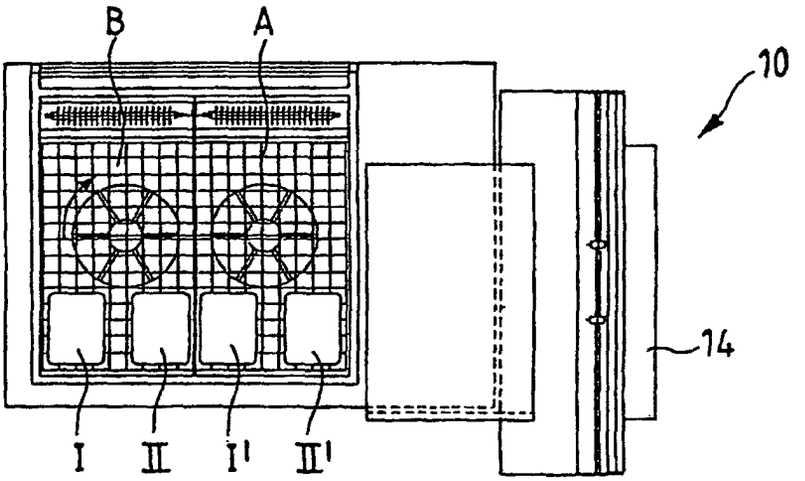

Fig.6e