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(54) **DRYER**

TROCKNER

SECHOIR

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Description

[0001] The object of the invention is a dryer and a dryer system according to the preambles of the independent claims presented further below (see for example EP 1 030 130).

[0002] Different dishcloths and kitchen towels are typically kept after use on a shelf in the dish closet, or left hanging on the kitchen tap. There are also different racks and hangers, which comprise a frame portion and one or more hanger means fixed to the frame portion, whereby a dishcloth may be hanged on the hanger means to dry. However, a problem with known dryers is that drying without additional heat will change the dishcloth into a smelling cloth as time goes by. A too slow drying will in addition cause bacteria accumulation and growth in the cloth.

[0003] The object of the present invention is thus to provide an improved dryer and dryer system.

[0004] Then an object is to provide a dryer, which rapidly and effectively dries a towel put into the dryer, such as a dishcloth.

[0005] A particular object is to provide a dryer and a dryer system, which has a simple structure and which can be easily mounted without any particular skill.

[0006] In order to attain the objects mentioned above a dryer and a dryer system according to the invention are characterised in what is defined in the characterising parts of the independent claims presented further below.

[0007] Then in a typical dryer according to the invention the frame portion comprises at least one plate-like radiator member, which is made of a material with generally good heat conducting properties, and a heat source functionally coupled to the radiator member in order to heat the radiator member.

[0008] In an advantageous dryer according to the present invention the radiator member is a plate-like body having a first surface and a second surface, and the heat source is attached to the first surface of the plate-like body. When a plate-like body is used as the radiator it provides a wide drying area having an even heat distribution, whereby the drying is as efficient as possible. Further, when the heat source is attached to the first surface of the plate-like body it provides a simple dryer structure, which can be rapidly manufactured.

[0009] In some applications the dryer can be realised so that it is formed by two plates arranged on top of each other, with the first surfaces against each other, whereby the heat source is attached between the two plates. Then the heat source is protected from getting dirty, for instance, and it is easier to use the heat source by utilising its both sides.

[0010] In an advantageous dryer according to the invention the radiator member is at least mainly made of a metal plate. The advantage of metal plate is its very good heat conduction property, which provides a radiating surface radiating the heat uniformly, even if the heat source would not extend over the whole area of the radiator member. A further advantage of metal plate is its easy workability, whereby it provides a final product at reasonable cost.

[0011] In an advantageous dryer according to the invention the heat source is a film-like heating element. The advantage of a film-like heating element is its thinness, whereby the dryer can be made so that it occupies a minimal space. A film-like heating element is further economically advantageous.

[0012] In an advantageous dryer according to the invention the heating element is arranged to be heated by using a voltage of 12 V to 48 V, whereby a safe use of the dryer is guaranteed, and whereby it requires no particular electrical work or work with heating water piping to render it functional.

[0013] In an advantageous dryer according to the present invention the radiator member is at least partly corrugated and/or folded. A corrugated and/or folded surface ensures that a cloth being dried in the dryer will not be attached to the radiator, at least not along its entire length. Then the air can circulate between the cloth and the dryer, which further makes the drying more effective. In addition the waves and/or folds will also increase the heat radiating area, compared to a straight plate surface.

[0014] An advantageous hanger member of a dryer according to the present invention comprises at least one bar fastened to the frame portion. For instance, compared to a hook hanger the advantage of a bar is that the cloth to be dried is spread over a wider area, whereby the drying is effective. The bar is advantageously fastened to the frame portion via a fastening plate comprising one or more fastening grooves in order to connect the fastening plate to the frame portion, and at least two fastening holes to fasten the bar to the fastening plate. Then the bar can be fastened to the frame portion without tools, whereby the dryer can be rapidly assembled.

[0015] An advantageous dryer according to the present invention comprises fastening means for fastening the dryer to a wall. Very advantageously the fastening means comprises a sticker member, whereby the fastening can be made without holes made in the fastening base.

[0016] According to a very advantageous embodiment of the invention the dryer is a cloth dryer. Cloth means in this context different kitchen cloths, such as dishcloths and drying cloths. Due to the simple and lightweight construction the dryer can be installed in a desired place in the kitchen for drying cloths. Then the hygiene of the cloths can be improved by drying.

[0017] A typical dryer according to the invention can be assembled of components for a dryer system. A typical dryer system according to the present invention comprises at least one plate-like radiator member model, which is made of a material with mainly good heat conducting properties and which is arranged to act as the frame portion of the dryer system, and to which a heat source is functionally coupled in order to heat the radiator member during the use of the dryer system. There may be differ-

ently shaped radiator member models, such as planar surfaces, arched or folded models. There may be also radiator member models of several different sizes. A number of fastening means, such as holes, are arranged in the radiator member models to enable the fastening of one or more hanger members to the radiator member. In addition the dryer system comprises different hanger members models forming a set, from which the hanger of the dryer system can be chosen to make a desired hanger assembly. In a buying situation the dryer system according to the present invention enables the end user of the dryer to choose a radiator member of a desired shape and size and to add to it a number of different hanger members, which are mutually identical or different, from the set of hanger member models.

[0018] In an advantageous dryer system according to the present invention at least some of the fastening means are arranged at a constant distance from each other. Correspondingly, in such hanger member models, which comprise two or more fastening points, the fastening points are arranged at a constant distance or its multiple from each other. Then it is for instance possible to fasten the bar-like hanger members to the radiator member when the radiator already has fastening means so that their distance corresponds to the distance between the fastening points in the hanger members.

[0019] In addition it is possible that at least a part of the hanger members comprise fastening means corresponding to those of the radiator member in order to attach the hanger members to other hanger members.

[0020] The greatest advantage of a dryer according to the present invention is its simple operating principle, which enables a simple and advantageous structure of the dryer.

[0021] The simple structure of the present dryer further enables the realisation of a modular dryer system, because a plurality of fastening means can be arranged at a reasonable cost in the radiator member used in the dryer according to the invention, whereby the user can attach hanger members of a desired shape or operating principle to these fastening means.

[0022] A further advantage of a dryer according to the invention is that it is easy to install in desired places of use.

[0023] A dryer according to a very advantageous embodiment of the present invention further enables a hygienic drying of a kitchen cloth.

[0024] The invention is described below in more detail with reference to the enclosed drawing, in which:

Figure 1 shows as an example a dryer according to the invention seen obliquely from the front side;

Figure 2 shows as an example a dryer according to the invention seen obliquely from behind;

Figure 3 shows schematically and as an example a fastening plate in a dryer according to the invention, and a bar fastened to this plate;

Figure 4 shows as an example a dryer according to the invention seen obliquely from the front side; and

Figure 5 shows as an example a dryer according to the invention seen obliquely from the front side.

[0025] Figures 1 and 2 show schematically and as an example an embodiment of the dryer 1 according to the invention. According to the figures the dryer 1 comprises a frame portion 2 and a hanger bar 3 connected to the frame portion 2.

[0026] The frame portion 2 comprises a plate 4 made of metal, which acts as a radiator, and a film-like heating element 6 attached to the first surface 5. The heating element 6 is arranged to operate at a voltage of 12 V to 48 V. The operating current of the heating element is supplied via a plug (not shown in the figures) to the dryer. Electricity can be supplied to the plug via a transformer (not shown in the figures) known as such.

[0027] During the use of the dryer the temperature of the heating element is typically about 40 to 50 °C. This temperature has been found to be sufficiently high in most applications to heat the heating radiator so that a body to be dried, such as a cloth, which is placed in the dryer, will be dried rapidly enough. An advantage of said temperature range is further that the temperature of the heating element is not so high that it would cause danger situations or accidents, for instance if the user of the dryer would touch the heating element with his hand.

[0028] According to the illustration in figures 1 and 2 the bar 3 is attached to the frame portion 2 with the aid of a fastening plate 8. The dryer 1 further comprises sticker members (not shown in the figures) acting as fastening means, with which the dryer can be fastened to a fastening base, such as a kitchen wall. For instance suction cups and/or fastening screws can also be used as fastening means.

[0029] As shown in figures 1 and 2, the plate forming the frame portion is bent to form folds in it. The plate could be shaped also to be concave or convex, or it may be straight, as shown further below. The size and shape of the plate, as well as the number of folds could of course vary in different applications. At the ends of the frame portion 2 there are formed a first fastening surface and a second fastening surface, to which sticker members are attached (not shown). The first fastening surface is shaped so that the fastening plate for the bar can be arranged in it.

[0030] The fastening plate 8 is formed of a plate-like body by making folds 12 in it. The hanger bar 3 is fastened to the fastening plate by leading it through the holes in the end portions of the fastening plate. The bent end portions of the fastening plate then in principle act as springs, which keep the bar in its place. At the central part of the fastening plate there is arranged a fold 12', into which the first fastening surface of the frame portion can be

pushed. This provides an assembly according to the figures 1 and 2.

[0031] Figure 3 shows a dryer 1 according to another embodiment. The radiator plate 4 acts as the frame portion, and behind it, or on its first surface, a heating element is attached to heat the radiator plate during the use of the dryer. According to the figure the radiator plate has a straight surface. Two bars 3 acting as hanger members are fastened to the radiator plate, whereby both bars are fastened at two fastening points 20 to the radiator plate.

[0032] Figure 4 shows a dryer 1 according to a third embodiment. The embodiment shown in figure 4 differs from that shown in figure 3 in that an additional bar 3' is fastened to the upper hanger bar, so that the additional bar supported by the fastening legs 21 is located farther out from the radiator's surface than the hanger bars 3.

[0033] Figure 5 shows schematically and as an example a plate-like radiator member model 30, which is made of a material with good heat conducting properties and which is arranged to act as the frame portion 2 of a dryer system of the invention. A number of holes 31 acting as fastening means are arranged in the frame portion 2 so that the holes extend through the frame portion to enable the fastening of one or more hanger members (not shown in the figure) to the radiator member. In addition a heat source (not shown in the figure) is functionally coupled to the frame portion in order to heat the radiator member during use of the dryer system.

[0034] Figure 5 shows by dotted lines a part of the alternative locations of the holes. It is further possible that more holes are made in the frame portion than necessary in the utilisation situation of the dryer, so that the user of the dryer will be able to fasten hanger members to the holes in order to make a dryer according to his or her own requirements. In addition it is possible to arrange the distance between the holes to be constant, so that the distance between the hanger bars can correspond to a multiple of the distance between adjacent holes.

[0035] The embodiment shown in figure 5 has thus four holes 31. The dryer is designed so that the two leftmost holes can receive a hanger hook or pin of a desired model, and a hanger bar can be fastened with the aid of the two rightmost holes. To a person skilled in the art it is natural that the dryer can be used so that also a wide bar is fastened with the aid of the holes on the sides, i.e. by the leftmost and rightmost holes, as shown in the figures presented above.

[0036] There are typically many different hanger models. For instance different hooks and bars may act as hangers, whereby they can be fastened to the frame portion with the aid of one or more holes 31 in the frame portion. Thus the different hanger member models form a set, from which the hangers of the dryer system are arranged to be chosen in order to provide a desired hanger assembly.

[0037] The invention is not intended to be limited to the embodiments presented as examples above, but on the contrary it is intended to be widely interpreted within the scope of the claims presented further below.

[0038] Thus a dryer according to the present invention can be realised also so that a steel door or an internal surface of a closet in the kitchen or bathroom acts as the radiator member of the dryer, whereby the heating element is attached to the backside of the door/internal surface or within it. Then a dryer according to the present invention can be integrated as a part of the furnishing in a kitchen or a bathroom, which results in a very practical solution.

Claims

1. A dryer comprising at least a frame portion and one or more hanger members attached or attachable to the frame portion, the frame portion comprising at least one plate-like radiator member, which is made mainly of a material with good heat conducting properties, and a heat source functionally coupled to the radiator member in order to heat the radiator member, **characterised in that** the radiator member is plate-like body having a first surface and a second surface, that the heat source is attached to the first surface of the plate-like body and that the radiator member is at least partly corrugated and/or folded.

2. A dryer according to claim 1, **characterised in that** the radiator member is at least mainly made of metal plate.

3. A dryer according to any previous claim, **characterised in that** the heat source is a film-like heating element.

4. A dryer according to any previous claim, **characterised in that** the heating element is arranged to be heated using a voltage of 12 V to 48 V.

5. A dryer according to any previous claim, **characterised in that** the hanger member comprises at least one bar fastened to the frame portion.

6. A dryer according to claim 5, **characterised in that** the bar is fastened to the frame portion with the aid of a fastening plate comprising one or more fastening grooves in order to connect the fastening plate to the frame portion, and at least two fastening holes in order to fasten the bar to the fastening plate.

7. A modular dryer system, **characterised in that** the system comprises:

   - at least one dryer of claim 1, whereby a number of fastening means such as holes are arranged in the radiator member in order to enable the fastening of one or more hanger members to the radiator member, and

- different hanger member models forming a set, from which the hangers of the dryer system are arranged to be chosen in order to make a desired hanger assembly.

8. A dryer system according to claim 7, **characterised in that** at least some of the fastening means are arranged at a constant distance from each other, and that in hanger member models comprising two or more fastening points the fastening points are arranged at said constant distance or its multiple from each other.

Patentansprüche

1. Trockner mit zumindest einem Rahmenabschnitt und einem oder mehreren am Rahmenabschnitt befestigten oder befestigbaren Aufhängeelementen, wobei der Rahmenabschnitt zumindest ein plattenähnliches Radiatorelement, das vorwiegend aus Material mit guten Wärmeleiteigenschaften hergestellt ist, und eine Wärmequelle aufweist, die mit dem Radiatorelement funktionell gekoppelt ist, um dieses zu erwärmen, **dadurch gekennzeichnet, dass** das Radiatorelement ein plattenähnlicher Körper mit einer ersten und einer zweiten Oberfläche ist, dass die Wärmequelle an der ersten Oberfläche des plattenähnlichen Elements angebracht ist, und dass das Radiatorelement zumindest teilweise gewellt und/oder gefaltet ist.

2. Trockner nach Anspruch 1, **dadurch gekennzeichnet, dass** das Radiatorelement zumindest vorwiegend aus einer Metallplatte besteht.

3. Trockner nach einem vorherigen Anspruch, **dadurch gekennzeichnet, dass** die Wärmequelle ein folienähnliches Heizelement ist.

4. Trockner nach einem vorherigen Anspruch, **dadurch gekennzeichnet, dass** das Heizelement eingerichtet ist, um unter Verwendung einer Spannung von 12 V bis 48 V erwärmt zu werden.

5. Trockner nach einem vorherigen Anspruch, **dadurch gekennzeichnet, dass** das Aufhängeelement zumindest eine am Rahmenabschnitt befestigte Stange enthält.

6. Trockner nach Anspruch 5, **dadurch gekennzeichnet, dass** die Stange mithilfe einer Befestigungsplatte, die eine oder mehrere Befestigungsnuten zum Verbinden der Befestigungsplatte mit dem Rahmenabschnitt und zumindest zwei Befestigungslöcher zum Befestigen der Stange an der Befestigungsplatte enthält, am Rahmenabschnitt befestigt ist.

7. Modulares Trocknersystem, **dadurch gekennzeichnet, dass** das System umfasst:

- zumindest einen Trockner nach Anspruch 1, wobei eine Reihe von Befestigungsmitteln, beispielsweise Löcher, im Radiatorelement angeordnet sind, um ein Befestigen eines oder mehrerer Aufhängeelemente am Radiatorelement zu ermöglichen, und
- unterschiedliche Aufhängeelement-Modelle, die einen Satz bilden, von dem die Aufhänger des Trocknersystems eingerichtet sind, um zur Bildung einer gewünschten Aufhängeelement-Anordnung ausgewählt zu werden.

8. Trocknersystem nach Anspruch 7, **dadurch gekennzeichnet, dass** zumindest einige der Befestigungsmittel in einem gleichmäßigen Abstand voneinander angeordnet sind, und dass die Befestigungspunkte bei Aufhängeelement-Modellen, die zwei oder mehrere Befestigungspunkte aufweisen, in diesem gleichmäßigen Abstand voneinander oder einem Vielfachen davon angeordnet sind.

Revendications

1. Séchoir comprenant au moins une partie de bâti et un ou plusieurs éléments de suspension fixé(s) ou pouvant être fixé (s) à la partie de bâti, la partie de bâti comportant au moins un élément de radiateur de type plaque, lequel est constitué principalement d'un matériau doté de bonnes propriétés de conduction de chaleur, et une source de chaleur couplée fonctionnellement à l'élément de radiateur afin de chauffer l'élément de radiateur, **caractérisé en ce que** l'élément de radiateur est un corps de type plaque présentant une première surface et une seconde surface, **en ce que** la source de chaleur est fixée à la première surface du corps de type plaque et **en ce que** l'élément de radiateur est, au moins partiellement, ondulé et/ou à plis.

2. Séchoir selon la revendication 1, **caractérisé en ce que** l'élément de radiateur est au moins principalement constitué d'une plaque métallique.

3. Séchoir selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la source de chaleur est un élément chauffant de type film.

4. Séchoir selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément chauffant est agencé afin d'être chauffé en utilisant une tension de 12 V à 48 V.

5. Séchoir selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément de

suspension comporte au moins une barre fixée à la partie de bâti.

6. Séchoir selon la revendication 5, **caractérisé en ce que** la barre est fixée à la partie de bâti à l'aide d'une plaque de fixation comprenant une ou plusieurs gorges de fixation afin de raccorder la plaque de fixation à la partie de bâti, et au moins deux trous de fixation afin de fixer la barre sur la plaque de fixation.

7. Système de séchoir modulaire, **caractérisé en ce que** le système comprend :

- au moins un séchoir selon la revendication 1, de sorte qu'un nombre de moyens de fixation tels que des trous sont disposés dans l'élément de radiateur afin de permettre la fixation d'un ou de plusieurs élément(s) de suspension sur l'élément de radiateur, et
- différents modèles d'élément de suspension constituant un ensemble, à partir duquel les éléments de suspension du système de séchoir sont agencés pour être choisis afin de former un assemblage de suspension souhaité.

8. Système de séchoir selon la revendication 7, **caractérisé en ce que** quelques uns au moins des moyens de fixation sont agencés à une distance constante l'un de l'autre, et **en ce que** dans les modèles d'élément de suspension comportant deux ou plusieurs points de fixation, les points de fixation sont arrangés à ladite distance constante l'un de l'autre, ou suivant un multiple de cette distance.

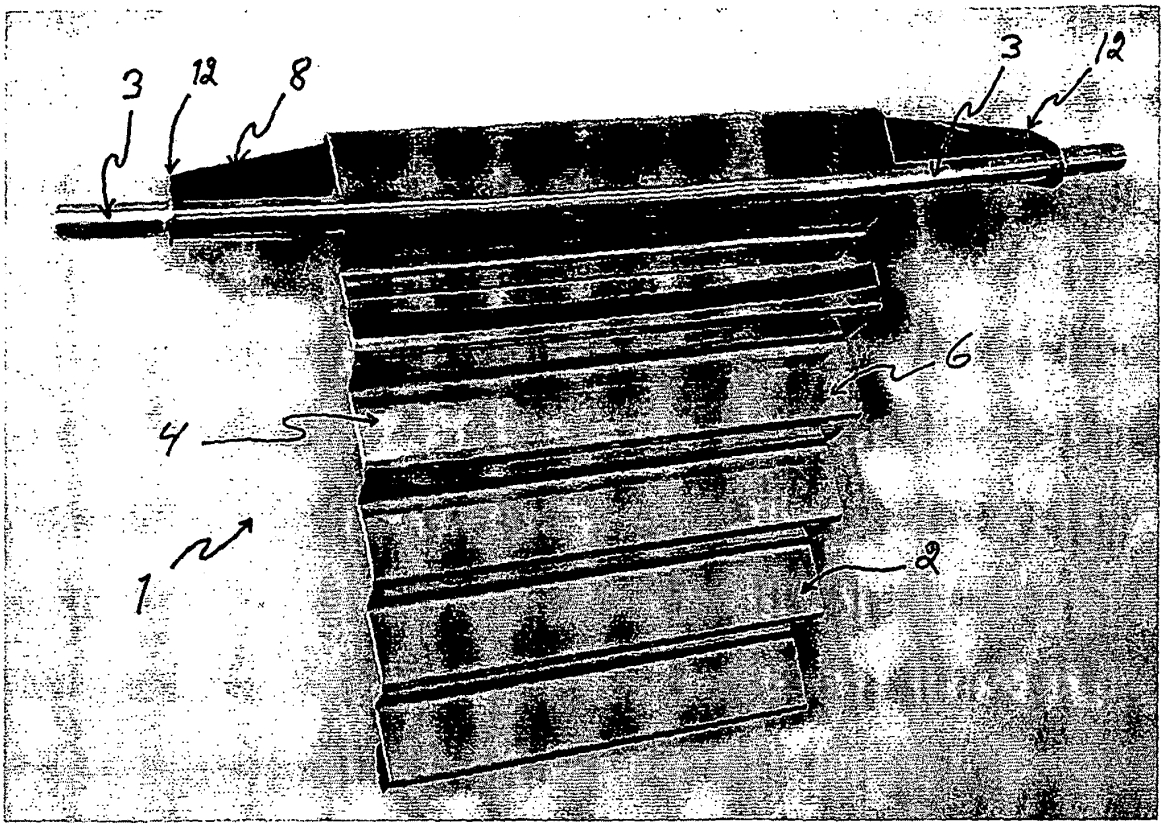


FIG. 1

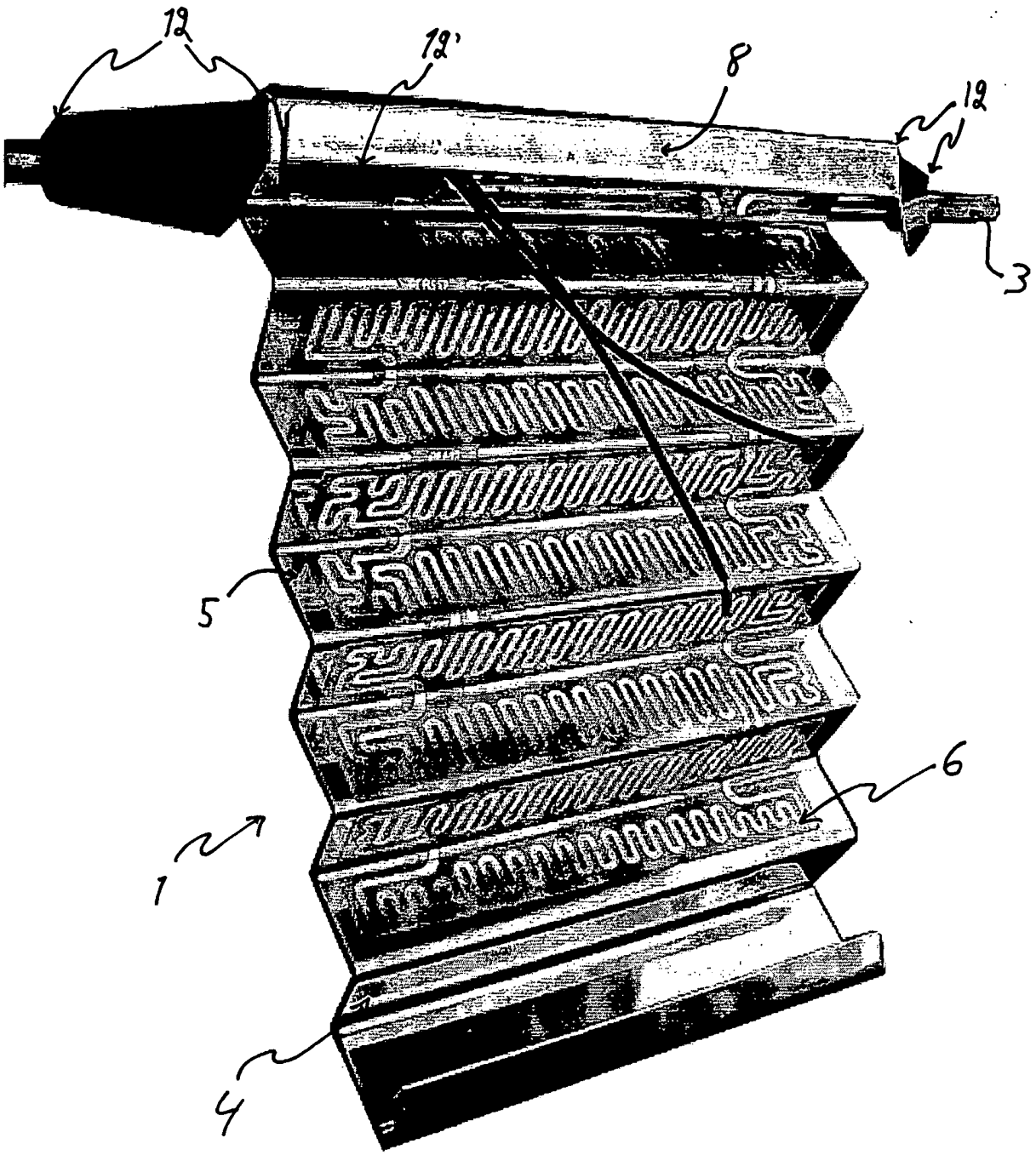


FIG. 2

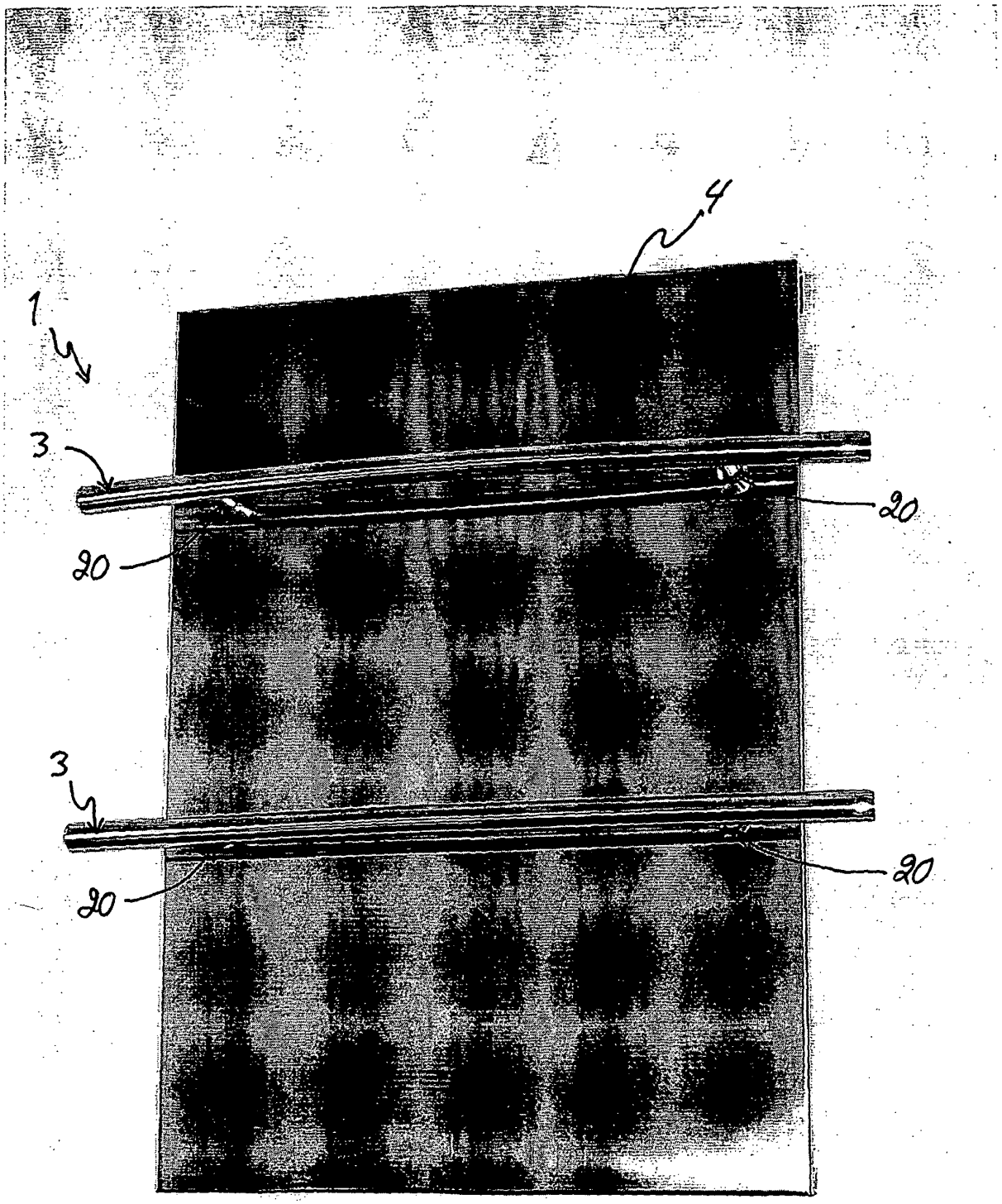


FIG. 3

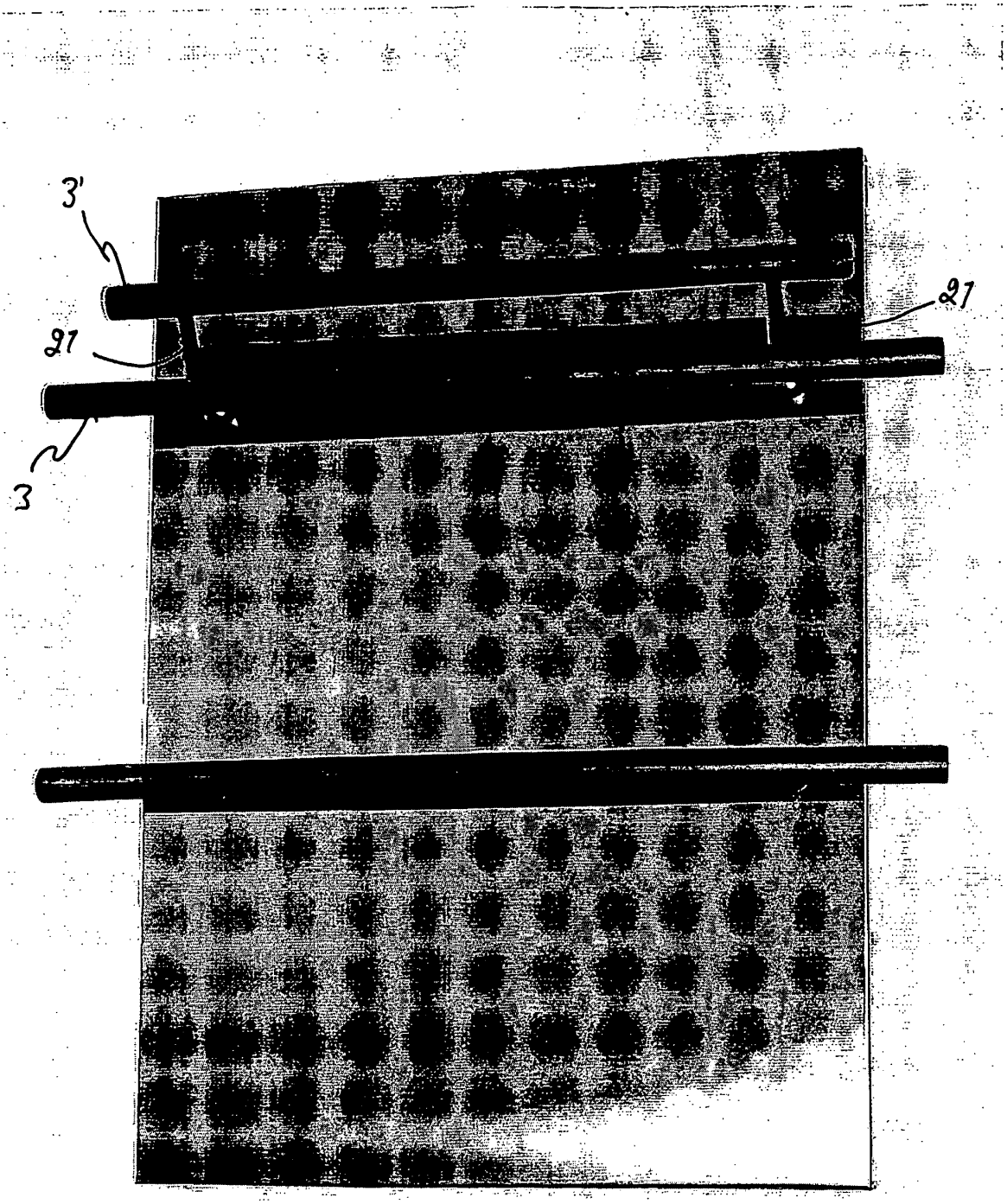


FIG. 4

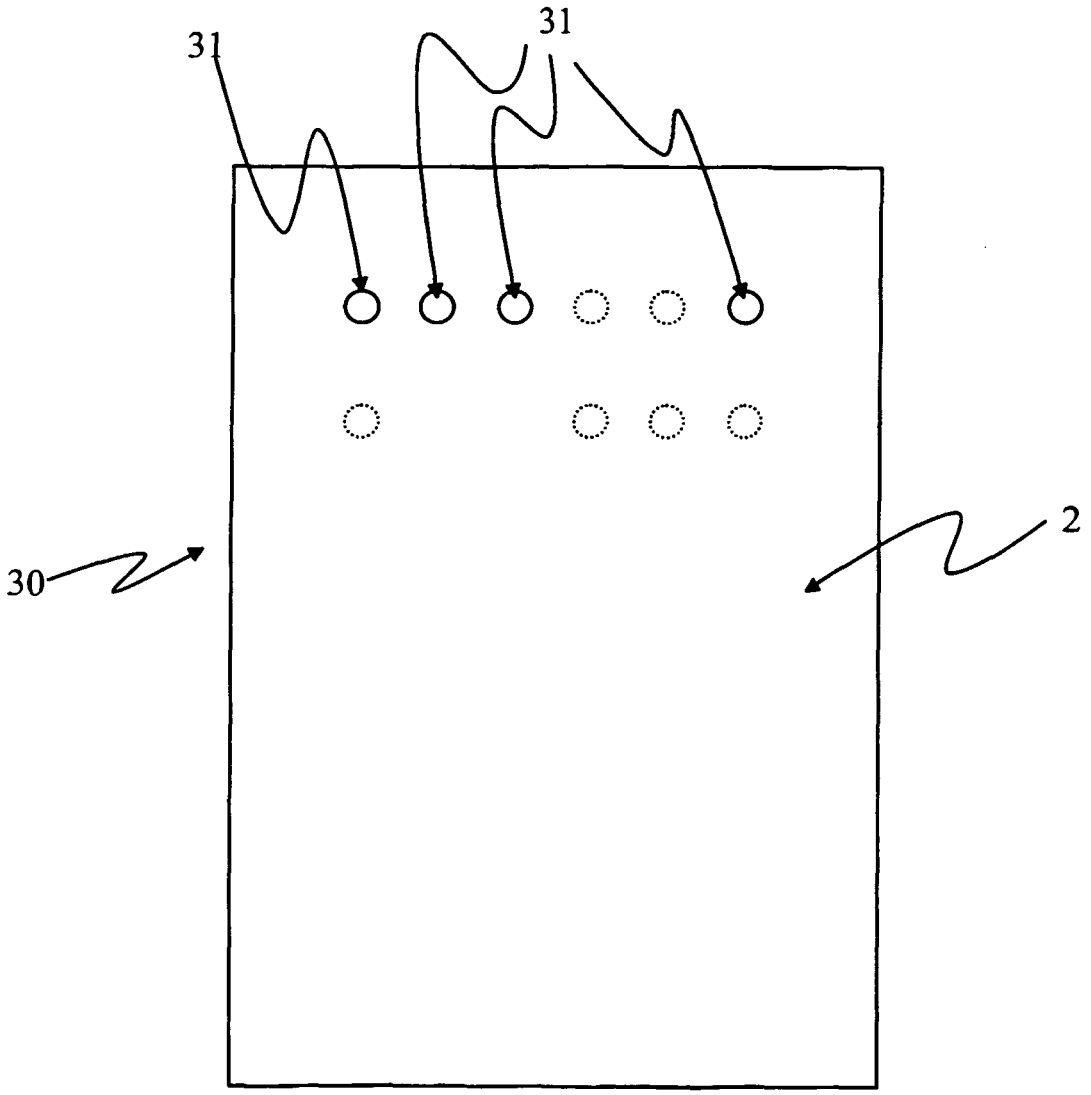


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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