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(54) **Bearing construction for high power liquid condensers and coolers**

(57) A bearing construction, specifically designed for high power liquid condensers and coolers comprises, in alternative to a conventional panel construction, a grid construction made of a series of tie-rods and struts, of suitable size and arrangement, adapted to support the

air conveyers and related fans and fittings, thereby allowing to make a very strong product which can resist against mechanical stresses due to the movements and handlings caused by the transport and assembling of the bearing construction.

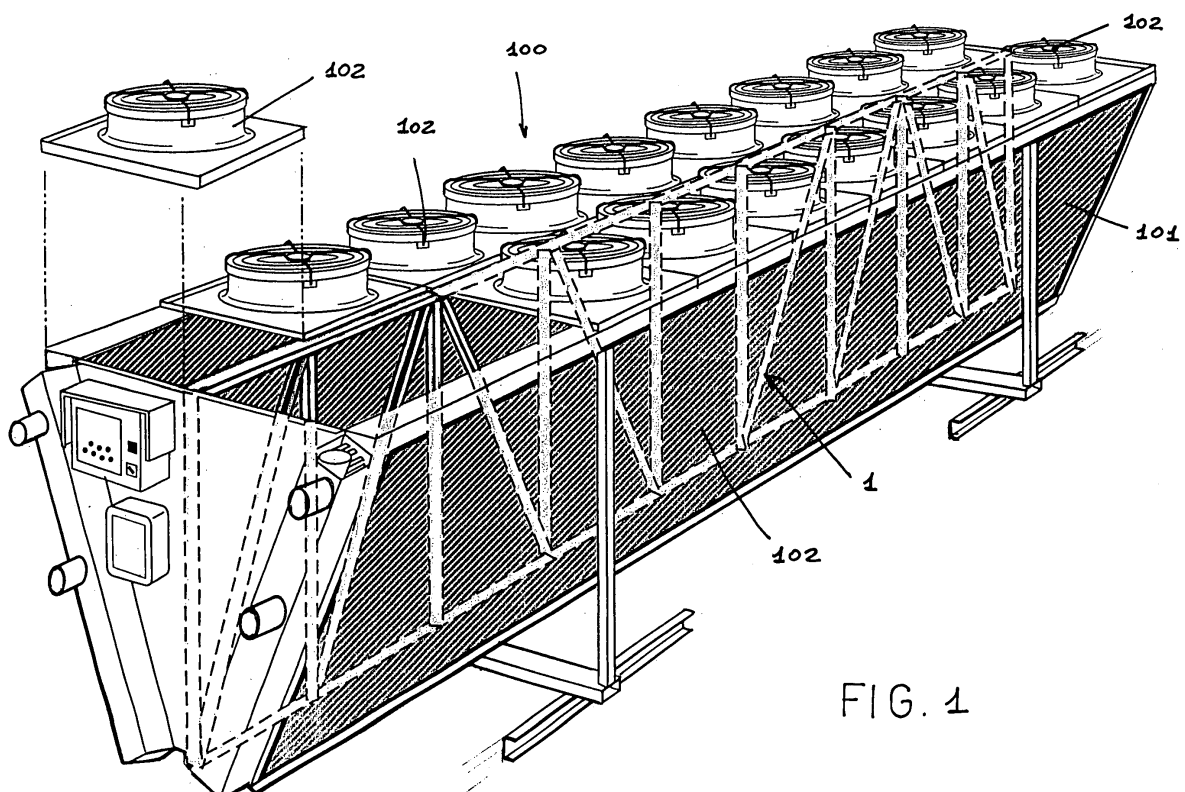


FIG. 1

EP 1 901 019 A2

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a bearing construction, specifically designed for high power liquid condensers and coolers.

[0002] As is known, commercially available high power liquid condensers and coolers, usually comprising two slanted batteries and two rows of fans, are constructed starting from a bearing construction, in turn made of steel sheet panels, as is shown in figure 12.

[0003] The main function of the panel inner construction is that to properly support the batteries and air conveyers, with the related fans.

[0004] Moreover, the above mentioned panel construction, characterizing the structure of conventional liquid condensers and coolers, is necessary to provide a product resisting against mechanical stresses due to the product transport and assembling handlings and movements.

[0005] The above disclosed conventional panel construction has some advantages: for example, the separating of the air flow for each air fan may be useful for operating conditions providing an operation with a single operating battery, with the fans arranged adjoining it, or an operation with an ON-OFF adjusting system, for properly adjusting the power, and operating based on a stop of pairs of fans.

[0006] However, the prior panel construction is also affected by several drawbacks.

[0007] In particular, the making cost of the steel sheet panels, and their assembling inside the product, is a comparatively high one.

[0008] Moreover, the steel sheet panels have a very high weight and, accordingly, also the weight of the end product is very high.

[0009] Such a high end product weight makes the handling, transport and assembling operations of the product very difficult.

[0010] Moreover, an installation of such a high weight article of manufacture requires that a proper base for supporting it, with a plurality of clamping point, be used.

SUMMARY OF THE INVENTION

[0011] Accordingly, the aim of the present invention is to provide a bearing construction, particularly for high power liquid condensers and coolers, which overcomes the above mentioned drawbacks affecting the prior art.

[0012] Within the scope of the above mentioned aim, a main object of the invention is to provide such a bearing construction allowing to greatly reduce the making cost.

[0013] Another object of the invention is to provide such a bearing construction allowing to also greatly reduce the weight of the end product.

[0014] Yet another object of the present invention is to provide such a bearing construction which, owing to the

reduction of the product weight, allows to greatly simplify the product handling, transport and installing operations.

[0015] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a bearing construction for high power liquid condensers and coolers, characterized in that said bearing construction is a grid bearing construction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the invention, which is illustrated, by way of an indicative, but not limitative, example, in the accompanying drawings, where:

Figure 1 is a perspective view of a condenser and cooler, including two slanted batteries, having two rows of fans, and a bearing construction according to the present invention;

Figure 2 is a side elevation view of the condenser and cooler, including two slanted batteries, and two rows of fans, and having a bearing construction according to the present invention;

Figure 3 is a top plan view of the condenser and cooler, including two slanted batteries, and two rows of fans, and having the bearing construction according to the invention;

Figure 4 is an elevation view showing the grid construction of a system including two slanted batteries and two rows of two fans;

Figure 5 is a further elevation view, showing the grid construction of a system including two slanted batteries and two rows of three fans;

Figure 6 is a further elevation view, showing the grid construction of a system including two slanted batteries and two rows of four fans;

Figure 7 is yet another elevation view, showing the grid construction of a system including two slanted batteries and two rows of five fans;

Figure 8 is yet another elevation view, showing the grid construction of a system including two slanted batteries and two rows of six fans;

Figure 9 is yet another elevation view, showing the grid construction of a system including two slanted batteries and two rows of seven fans;

Figure 10 is yet another elevation view, showing the grid construction of a system including two slanted batteries and two rows of eight fans;

Figure 11 is yet another elevation view, showing the grid construction of a system including two slanted batteries and two rows of nine fans; and

Figure 12 shows a perspective view of a conventional type of bearing construction.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] With reference to the number references of the above mentioned figures, the bearing construction according to the present invention, which has been generally indicated by the reference number 1, has been specifically designed for a high power liquid condenser and cooler, generally indicated by the reference number 100, and including two slanted batteries 101, and two rows of fans 102.

[0018] The subject bearing construction has, according to the main aspect of the invention, a grid like configuration, and comprises, as main components thereof, a series of tie-rods and struts, having a suitable size and so arranged as to properly support the air conveyers and related fans 102 and batteries 101, thereby allowing to provide a very strong product which can easily resist against the mechanical stresses due to the transport and installation handlings and/or movements.

[0019] Figures 11 shows the bearing construction 1 of the condensers system 100, shown in figures 1-3, and comprising two slanted batteries and two rows of nine fans.

[0020] Figures 4 to 10 show seven examples of bearing constructions, respectively indicated by the reference numbers 201, 301, 401, 501, 601, 701 and 801, for systems including two slanted batteries and two rows of 2 - 3 - 4 - 5 - 6 - 7 - 8 fans.

[0021] It has been found that the invention fully achieves the intended aim and objects.

[0022] In fact, the invention provides a bearing construction, specifically designed for high power liquid condensers and coolers, adapted to properly support the air conveyers and related fans and batteries, thereby allowing to make a very strong product, adapted to resist against the mechanical stresses due to the transport and installation movements or handlings.

[0023] The subject bearing construction provides a plurality of advantages, with respect to conventional like bearing constructions, even from an operating standpoint.

[0024] For example, the inventive grid construction allows to greatly reduce any power losses of the product, for example due to a fan failure, owing to a full exploiting of the operating battery underlying the fan.

[0025] Another advantage is that a possible covering of the grid of the failed motor allows to prevent air from recirculating through the operating motors, which would further reduce the power loss of the device.

[0026] Moreover, the grid construction according to the present invention allows to eliminate the noise caused by possible sound resonances, as those generated by conventional panels as fan air passes therethrough.

[0027] Yet a further advantage is the great reduction of the number of the fixing or clamping elements for clamping to the ground the device, thereby consequently reducing the installation cost.

[0028] Yet a further advantage is that the installation supporting base is greatly simplified and of a much less cost.

[0029] Actually, under particular operating conditions, providing an operation of only a battery and fans adjoining thereto, or an operation with a power ON-OFF adjusting system, to be achieved by stopping pairs of fans, it is possible, with a little increase of the making cost, to easily assemble on the grid construction dedicated plastics material panels for separating the fan air flows.

[0030] With reference to figure 12, it should be apparent that the grid construction according to the present invention allows moreover to eliminate the outer sheet metal reinforcement elements which, on the contrary, are necessary in conventional like constructions.

[0031] Furthermore, the grid construction according to the present invention allows to reduce the number of the supporting cross members and, as aforesaid, the number of the clamping elements to clamp the construction to the ground.

[0032] By way of an example, the inner cross-members of the grid construction according to the present invention are reduced to only 1 - 2, with respect to the 4 - 8 of a conventional bearing construction.

[0033] Moreover, it is possible to greatly reduce the length of the outer longitudinal cross-members.

[0034] Yet another advantage of the grid construction according to the present invention is that the elimination of the outer reinforcement elements and the reduction of the length of the longitudinal outer cross-members, allows to greatly improve the air distribution through the operating batteries.

[0035] In practicing the invention, the used materials, as well as the contingent size and shapes, can be any, according on requirements.

Claims

1. A bearing construction for high power liquid condensers and coolers, **characterized in that** said bearing construction is a grid bearing construction.
2. A bearing construction, according to claim 1, **characterized in that** said bearing construction comprises a grid structure including a plurality of tie-rods and struts.
3. A bearing construction, according to one or more of the preceding claims, **characterized in that** said bearing construction is designed to be used for a high power liquid condenser and cooler including two slanted batteries and two fan rows.
4. A bearing construction, according to one or more of the preceding claims, **characterized in that** said bearing construction comprises, as main components thereof, a plurality of tie-rods and struts, so

sized and arranged as to support the air conveyers and related fans and batteries.

5. A bearing construction, according to one or more of the preceding claims, **characterized in that** said bearing construction allows to eliminate the outer reinforcement elements as conventionally used in prior like bearing construction. 5
6. A grid bearing construction, according to one or more of the preceding claims, **characterized in that** said bearing grid construction allows to reduce the number of supporting and clamping cross members. 10
7. A grid bearing construction, according to one or more of the preceding claims, **characterized in that** said bearing construction comprises outer longitudinal cross members of a comparatively small length. 15
8. A grid bearing construction, according to one or more of the preceding claims, **characterized in that** the elimination of the outer reinforced element and reduction of the length of the outer longitudinal cross members allow to improve the air distribution through the battery. 20
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9. A grid bearing construction, according to one or more of the preceding claims, **characterized in that**, in an operating condition providing to use a single battery and adjoining fans associated therewith, or an operation by a power ON-OFF adjusting system providing to stop pairs of fans, it is possible to easily assemble on the grid construction plastics material panels to separate the fan air flows. 30
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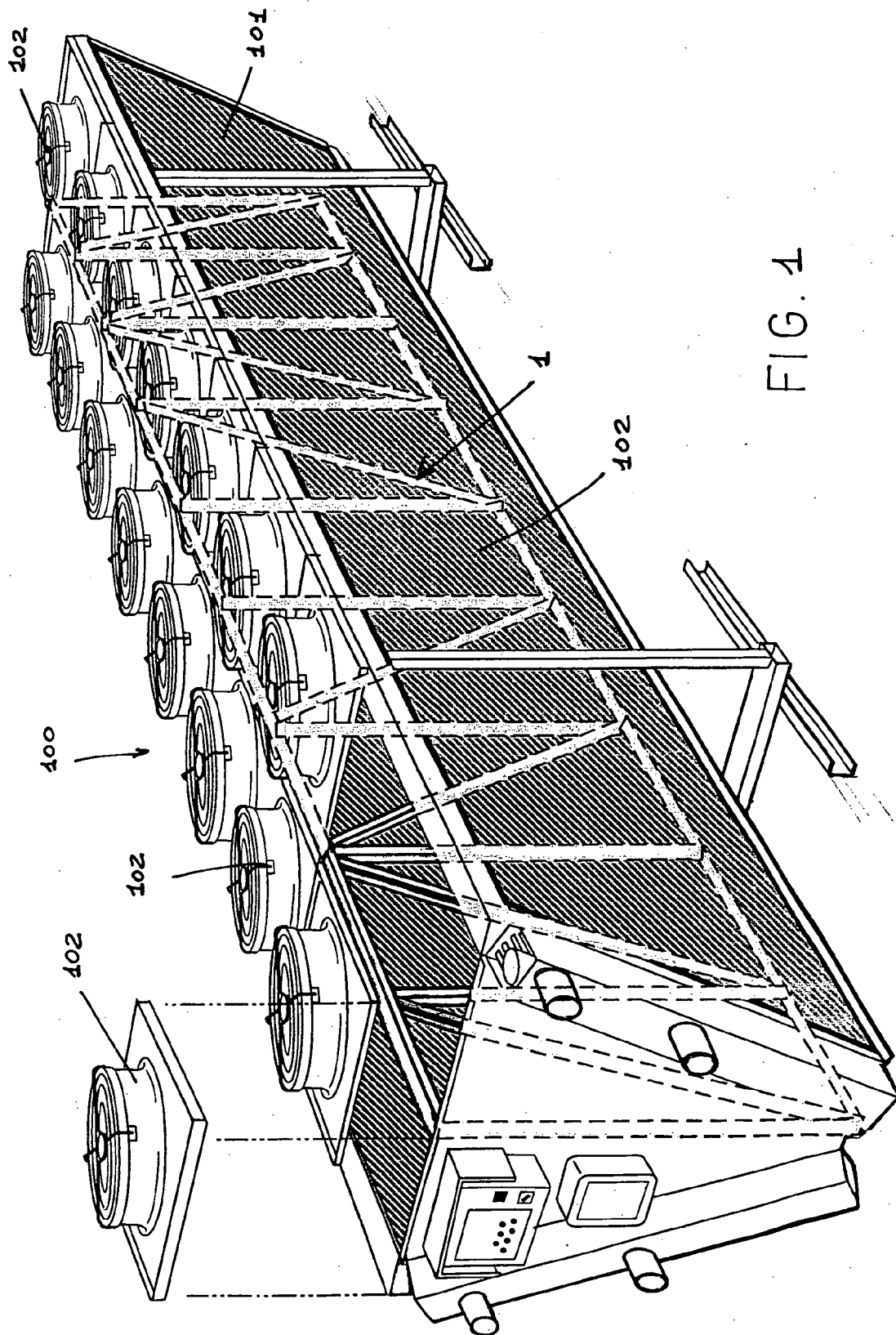


FIG. 1

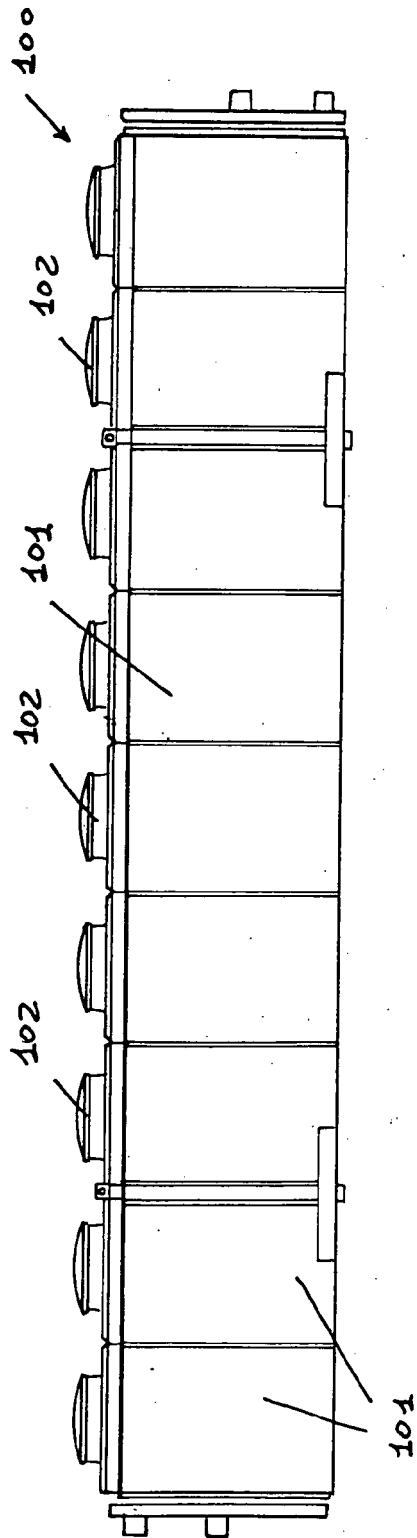


FIG 2

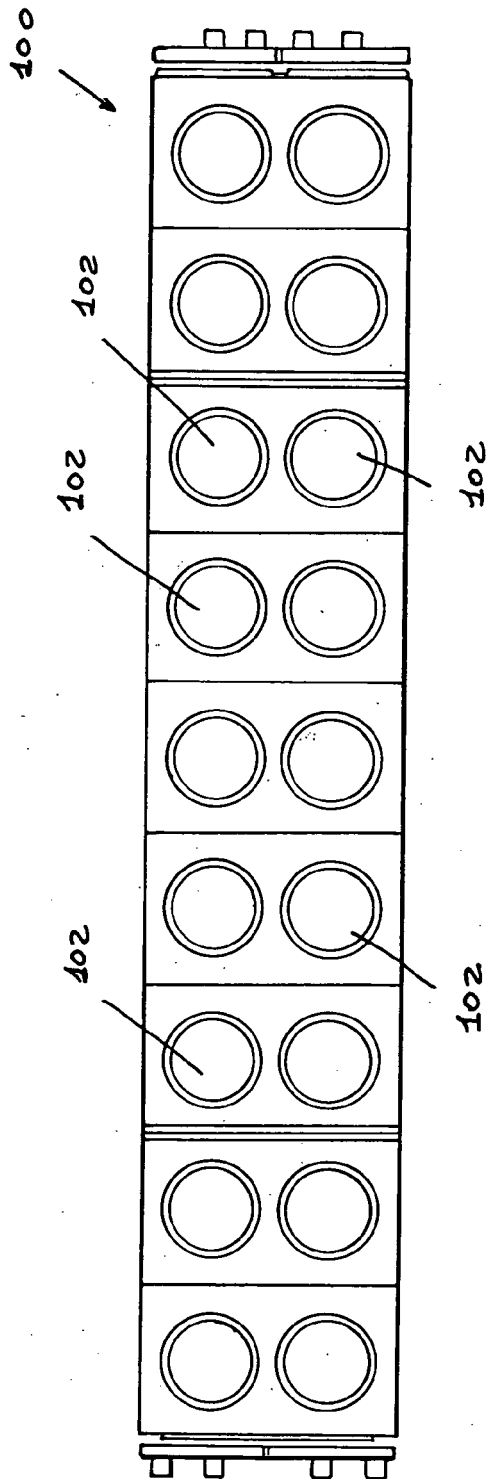


FIG 3

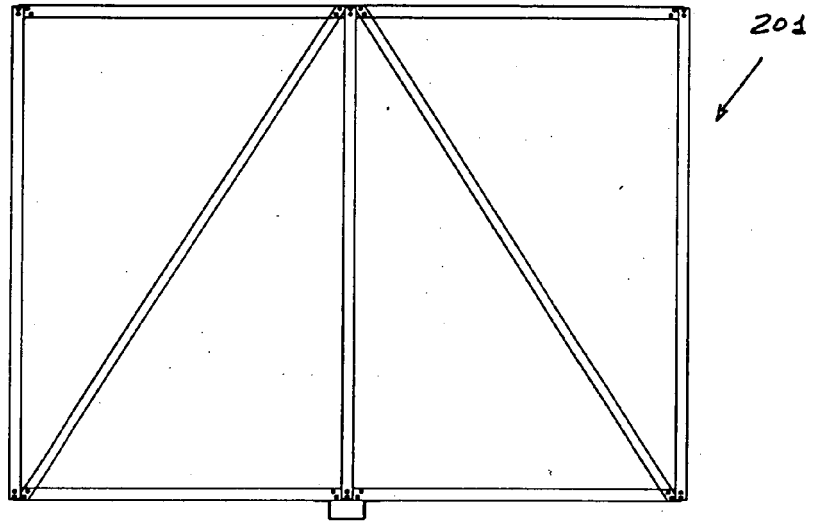


FIG 4

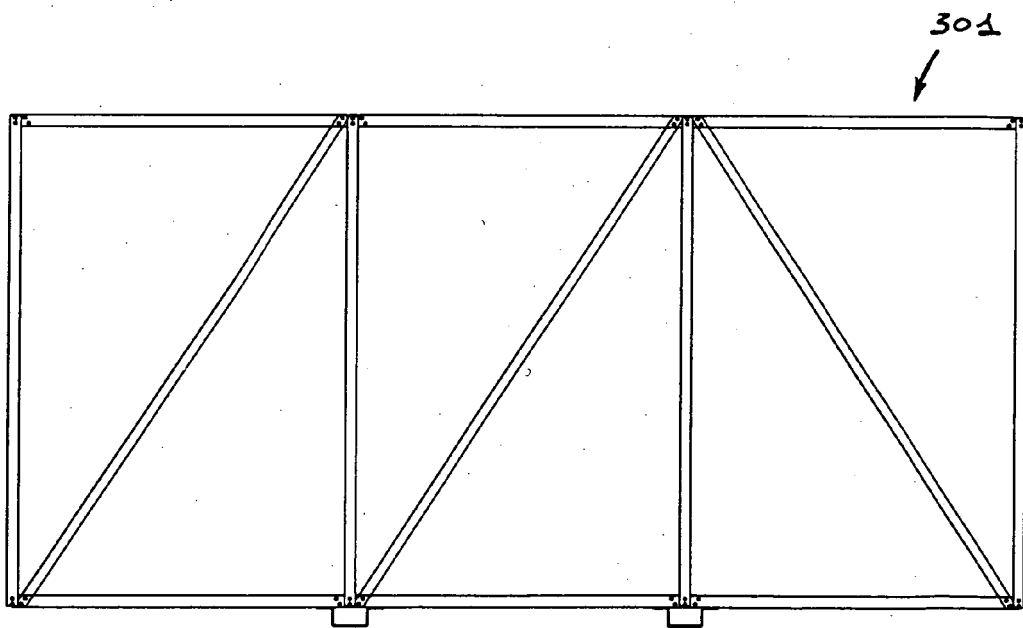


FIG 5

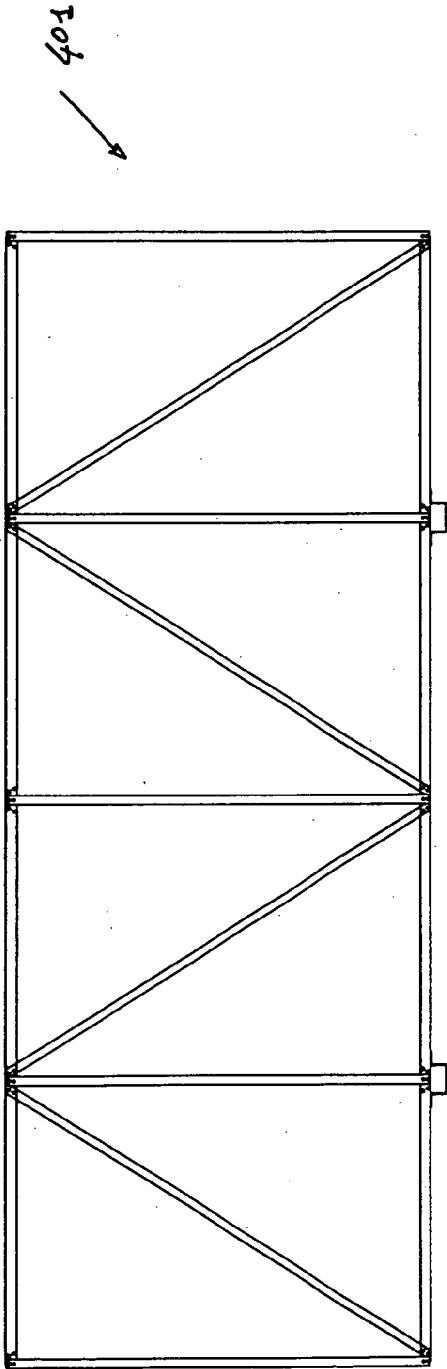


FIG. 6

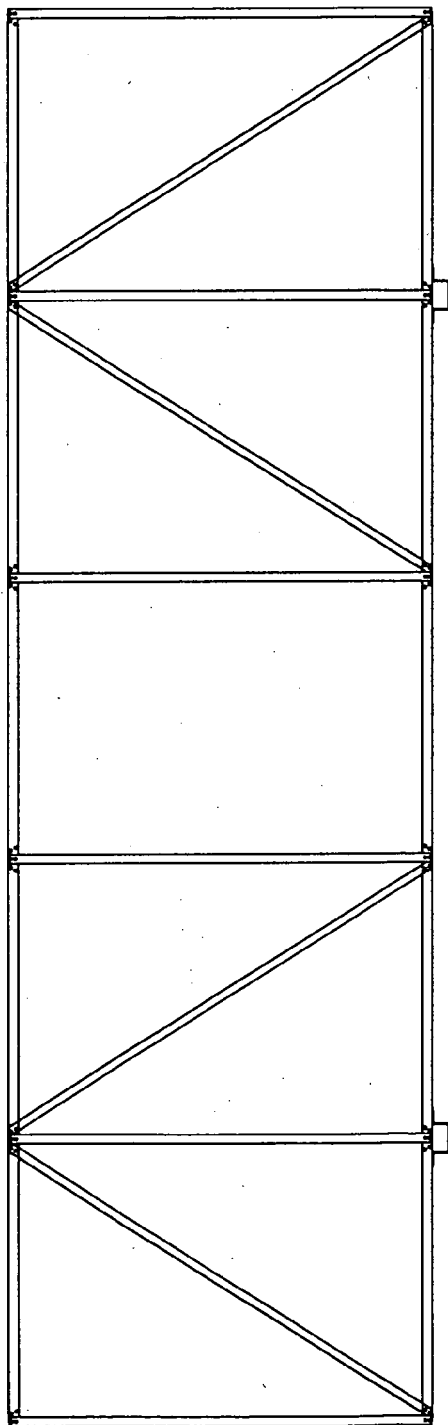


FIG. 7

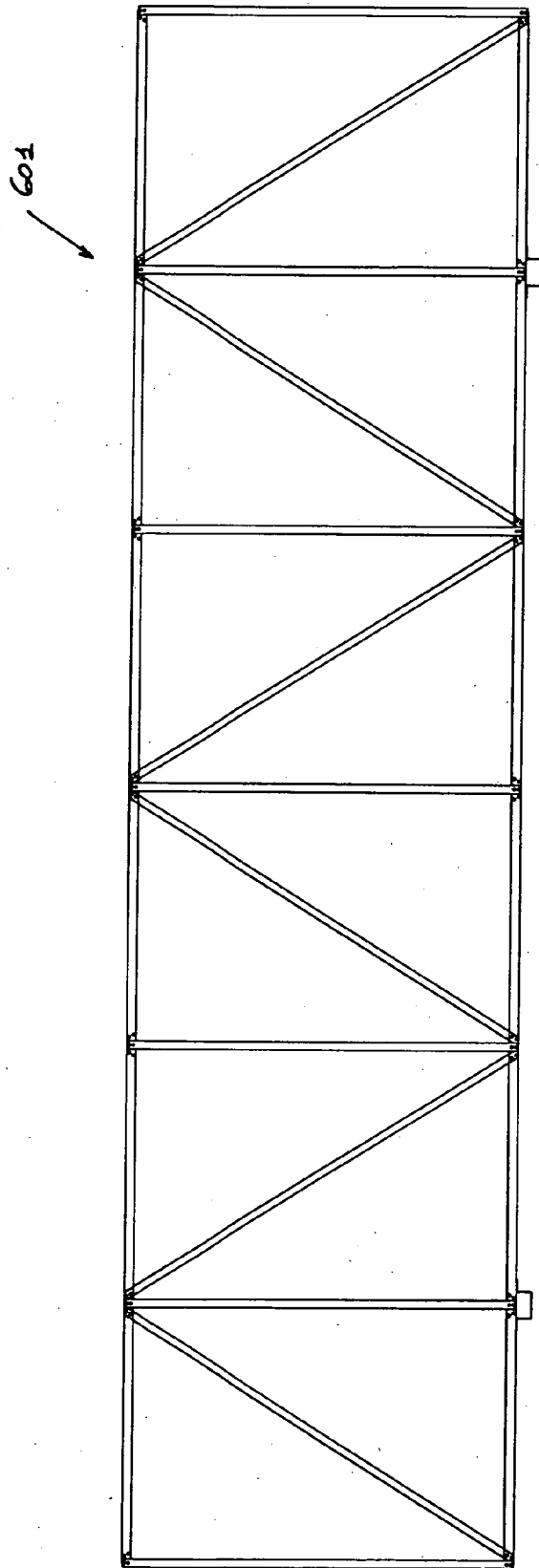


FIG. 8

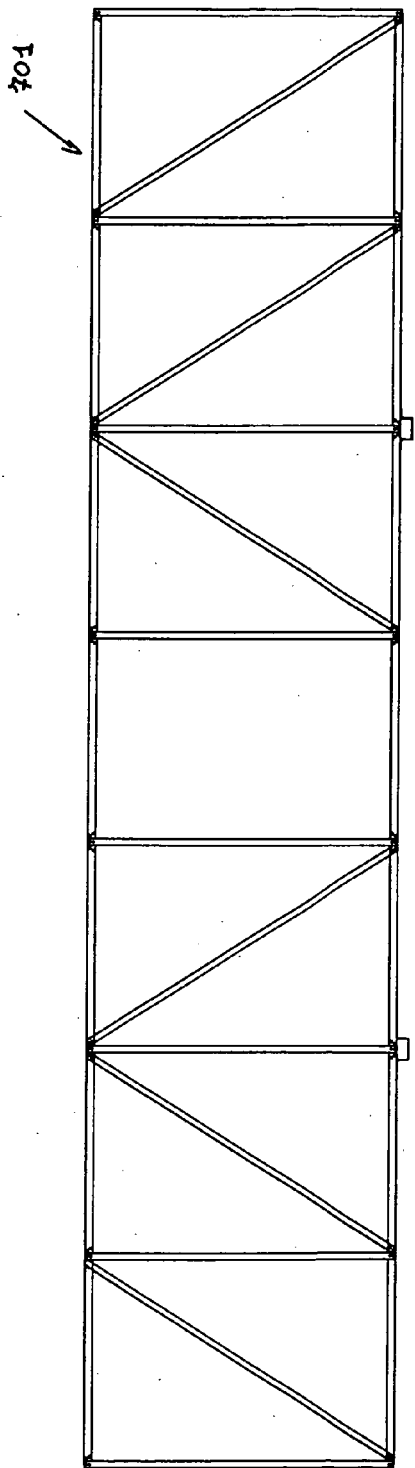


FIG. 9

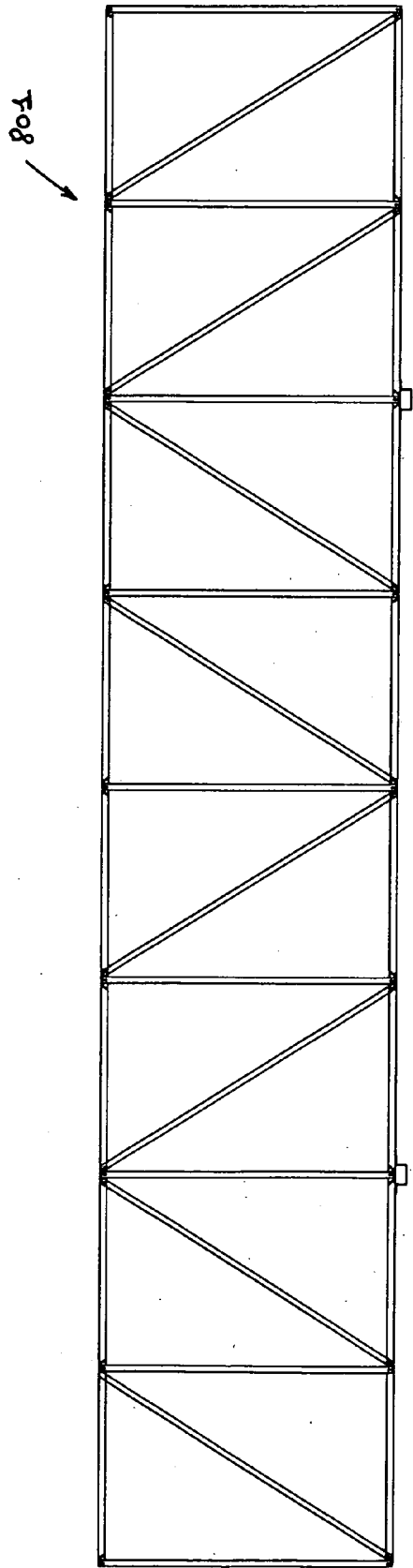


FIG. 10

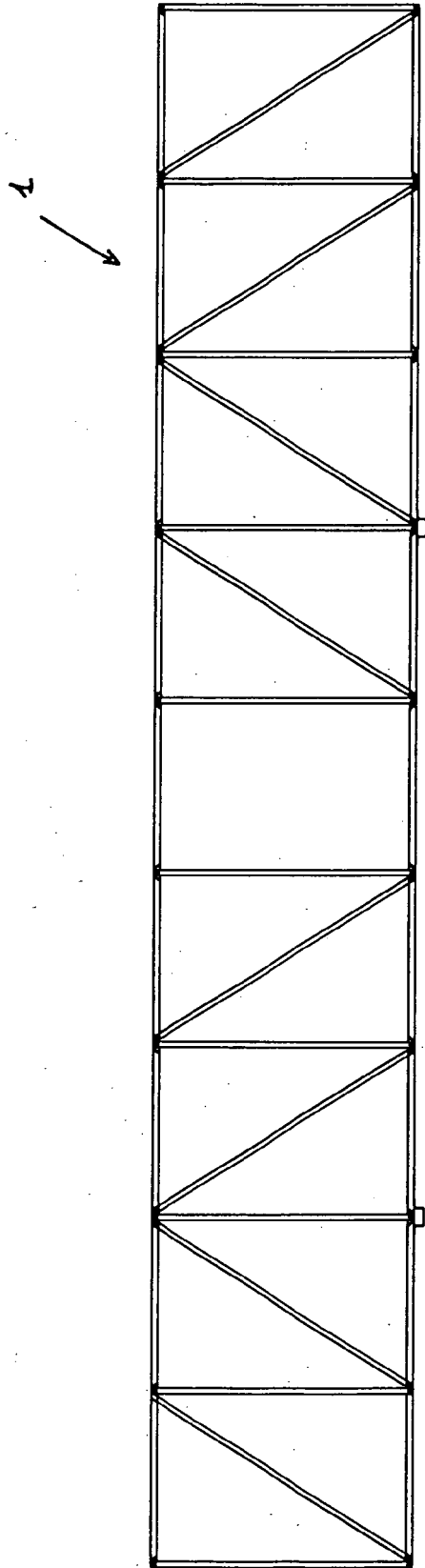


FIG. 11

