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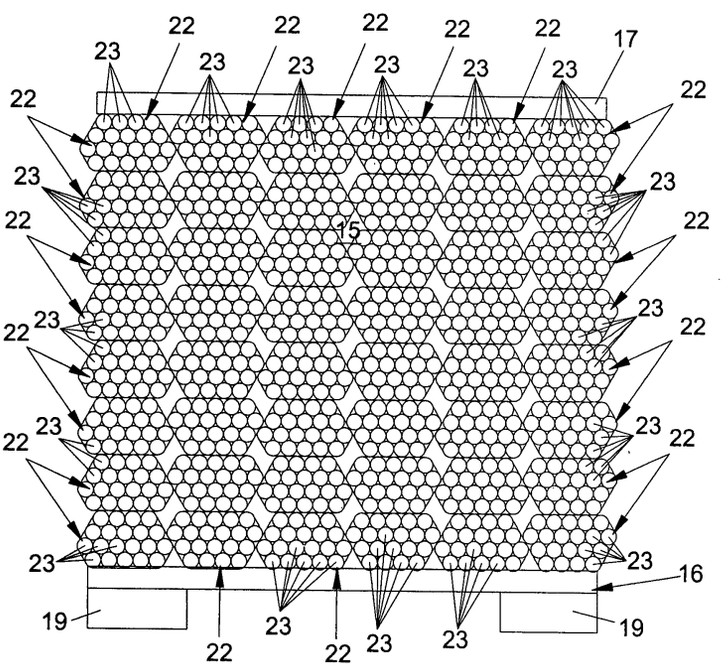
(54) Method for the production of a pallet having a high stability and resistance for tube bundles

(57) A method for the production of a pallet (10) having a high stability and resistance for bundles of tubes, in particular tubes (23, 33, 43) for industrial, electrical, electronic and electro-technical applications, comprising the following phases:

- preparing a series of tubes (23, 33, 43);
- packaging said tubes into bundles (22, 32, 42) with a polygonal section by means of a plastic film (14);
- neatly arranging the bundles of tubes so as to form stable bases, in order to create a package (15) of tube bundles (22, 32, 42) positioned on a series of supporting beams (16);
- preparing a series of simple beams (17) each above the package (15) in correspondence with each supporting beam (16);
- fastening the beams (16, 17) and package (15) with a metallic strap compressing them to form a pallet (10).

Fig. 2C



EP 1 577 231 A1

Description

[0001] The present invention relates to a method for the production of a pallet having a high stability and resistance for bundles of tubes.

[0002] More specifically, the invention relates to a method for the production of a pallet having a high stability and resistance for bundles of tubes, for industrial, electrical, electronic and electro-technical applications.

[0003] Pallets have long been used for the packaging of industrial materials to be moved, transported and stored.

[0004] Rigid tubes for the protection of wiring are known in the field of industrial applications in general, and in particular in the electrical, electronic and electro-technical applications. Said tubes are cut into a standard size, for example 3 metres, packaged into bundles comprising various tube units and subsequently placed in wooden frames fixed with nails or clips.

[0005] A pallet according to the known art is obtained, for example, by preparing bundles of tubes previously produced, inside wooden frames which are constructed using nails or clips and fastened by means of a metallic strap.

[0006] This type of package of tube bundles suitable for forming a pallet, according to the known art, is illustrated in figure 1.

[0007] According to the known art, the bundles 2 of tubes 3 are produced by wrapping the tubes with a plastic film 4, and the bundles 2 are subsequently stacked up to form a package which is then inserted in frames made up of wooden boards joined by means of nails or metallic clips.

[0008] The package is then secured by binding it with a metallic strap.

[0009] This palletizing system, which is commonly used, is not without disadvantages.

[0010] First of all, the bundles of tubes in the various diameters which are most commercially used, substantially ranging from 16 mm to 50 mm, are produced so as to maximize the number of tubes per pallet without paying attention to characteristics such as static stability, resistance to the planarity deformation of the pallet subsequently formed.

[0011] The bundles 2 of tubes according to the known art generally have an overall oval section, which is such as to not allow stable stacking when a package of various bundles is formed.

[0012] These drawbacks have consequences of various types and gravity.

[0013] The pallets tend to become deformed under even modest loads or during movement and transportation. The deformed pallet transmits permanent deformation to the tubes contained therein, making them unsuitable and at times they are rejected by the client.

[0014] Furthermore, the production of pallets with unstable tube bundles is difficult and requires high tractions in the strap and/or more structured frames for containing the tubes, maintaining a certain squared shape of the pallet during all the operations to which it is subjected, from its production to its dismantling for the use of the tubes.

[0015] The main objective of the present invention is consequently to overcome the above drawbacks of the known art by providing a method for the production of a pallet having a high stability and resistance for bundles of tubes.

[0016] Another objective of the present invention is to provide a method for the production of a pallet which has a high sturdiness and resistance for optimizing the moving, transportation and storage logistics of the pallets of tubes.

[0017] Also included in the objectives of the present invention, is that of providing a method for the production of a pallet having a high stability and resistance for tube bundles which allows the production costs and costs relating to the moving, transportation and storage logistics, to be reduced.

[0018] These and other objectives according to the present invention are achieved by the method for the production of a pallet having a high stability and resistance for tube bundles according to what is specified in claim 1.

[0019] Further characteristics of the invention are the object of the dependent claims.

[0020] The method for the production of a pallet having a high stability and resistance for bundles of tubes, in particular tubes for industrial, electrical, electronic and electro-technical applications, according to the invention, comprises the following phases:

- preparing a series of tubes;
- packaging said tubes into bundles with a suitable polygonal section by wrapping them with a plastic film;
- neatly arranging the bundles of tubes so as to form a package of tube bundles positioned on a series of supporting beams;
- preparing a series of simple beams, each above the package in correspondence with each supporting beam;
- fastening the beams and package with a strap compressing them to form a pallet.

[0021] The characteristics and advantages of a method for the production of a pallet having a high stability and resistance for bundles of tubes, in particular tubes for industrial, electrical, electronic and electro-technical applications, according to the present invention, will appear more evident from the following illustrative and non-limiting description, referring to the enclosed schematic drawings, in which:

figure 1 is a view of an end of various bundles of tubes according to the known art;

figures 2A, 3A, 4A are views of ends of the same

number of tube bundles for tubes having different diameters;
figures 2B, 3B, 4B are views of ends of pairs of tube bundles positioned side by side, of the types illustrated in figures 2A, 3A, 4A respectively;
figures 2C, 3C, 4C are schematic views of ends of the same number of pallets respectively produced with the bundle of tubes illustrated in figures 2A, 3A, 4A respectively;
figure 5 is a schematic side view of a pallet produced with the method according to the invention.

[0022] With reference to figures 2A, 3A, 4A, these illustrate the same number of bundles, 22, 32, 42 respectively of tubes, 23, 33, 43 respectively, in particular tubes for industrial, electrical, electronic and electro-technical applications, produced in the most commercially used diameters which vary from 16 mm to 50 mm.

[0023] It is quite evident, however, to experts in the field, that the diameters selected for the tubes are purely illustrative and can vary without altering the sense and specific characteristics of the present invention.

[0024] The method according to the illustrative embodiment of the invention therefore envisages the preparation of a series of tubes, whose number is selected in relation to the their diameter and comprises the packaging phase of said tubes into bundles, each having a polygonal section produced by binding with a plastic film 14.

[0025] Each of the bundles thus formed, has two opposite surfaces, 22a, 32a, 42a, respectively, both flat which are suitable positioned horizontally, stacking the bundles starting from the rest bases consisting of supporting beams 16.

[0026] These surfaces are connected to each other at each end by one or more substantially flat slanting surfaces, 22b, 32b, 42b, respectively, whose function is to provide a supporting plane for the corresponding slanting of the bundles positioned side by side forming a package 15.

[0027] The bundles are therefore positioned with the surfaces suitably orientated and in contact, on a series of supporting beams 16 so as to obtain a package 15 in which the result of the weighing forces thereon is almost zero, thus obtaining the self-supporting capacity of the package.

[0028] The method for the production of a pallet 10 according to the invention also comprises the phases of preparing a series of simple beams 17 each above the package 15 in correspondence with each supporting beam 16; binding the beams 16, 17 and package 15 by means of a metallic strap and compressing them to form a firmly bound pallet 10 which is structurally sturdy and has flat surfaces which make it easy to move, transport and stack up without drawbacks.

[0029] In particular, the tubes are not deformed as the self-supporting package 15 and beams allow a better distribution of the traction of the strap giving the finished palled greater strength.

[0030] The supporting beams 16 are equipped with a prop 19 situated below each of their ends, to favour the moving and stacking of the pallets 10.

[0031] To illustrate the invention, reference is now made to the three polygonal forms which can be mainly used for forming the bundles i.e. trapezoid, pentagon and hexagon.

[0032] It should be noted, however, that the configuration is optimized in relation to the diameter of the tubes, bearing in mind the maximum encumbrance requirements which the end-pallet must have to be able to be loaded onto the platform of a transport vehicle optimizing its available volume.

[0033] The forms and configurations used should be considered as being entirely general and can therefore be subject to variations and adaptations which are within the scope of the object of the invention.

[0034] With reference in particular to figures 2A-2C, these indicate a hexagonal bundle 22, i.e. having two horizontal surfaces 22a for the stacking of superimposed bundles and four slanting surfaces 22b which are used for the side supports between positioned side by side in the package 15.

[0035] With reference to figure 2B, this illustrates two of the above bundles 22 inverted with respect to each other arranged with the slanting surfaces in contact, in other configurations, however, the inverted arrangement may not be necessary for obtaining the support between the slanting surfaces and consequently the overall self-supporting capacity of the package 15.

[0036] With reference to figure 2C, this illustrates a package 15 formed by stacking and flanking bundles 22, arranged on supporting beams 16 equipped with props 19.

[0037] Simple beams 17 are positioned above said bundles 15 and the unit thus formed is ready to be bound with a metallic strap 18 (also with reference to figure 5).

[0038] Analogously, with reference to figures 3A-3C, these respectively indicate a pentagonal bundle 32, having two opposite horizontal surfaces 32a for the stacking of superimposed bundles and connected at one end by two slanting surfaces 32b and at the opposite end by a slanting surface 32b which are used for the side supports between the bundles 32 positioned side by side in the package 15.

[0039] With reference to figure 3B, this indicates two of the above bundles 32 side by side and arranged with the slanting surfaces in contact.

[0040] With reference to figure 3C, analogously to figure 2C, this illustrates a package 15 formed by stacking bundles 32 and positioning them side by side.

[0041] Analogously to the previous figures, with reference to figures 4A-4C, these indicate a bundle 42 with a trapezoidal configuration, having two opposite horizontal surfaces 42a, for the stacking of superimposed bundles and connected by two slanting surfaces 42b which are used for the side supports between bundles

42 positioned side by side in the package 15.

[0042] With reference to figure 4B, this indicates two of the above bundles 42 side by side and inverted with the slanting surfaces in contact.

[0043] With reference to figure 4C, this illustrates, analogously to figures 2C and 3C, a package 15 formed by stacking and positioning bundles side by side 42.

[0044] A finished pallet 10 is illustrated in a side view of figure 5 and consists of the two bundles 42 of figure 4A-4C, said pallet however is substantially similar for all tube formats and is produced according to the indications of the present method.

[0045] To summarize, the method for the production of a pallet 10 having a high stability and resistance for bundles of tubes, in particular tubes 23, 33, 43 for industrial, electrical, electronic and electro-technical applications, comprising the following phases:

- preparing a series of tubes 23, 33, 43;
- packaging said tubes into bundles 22, 32, 42 with a polygonal section by means of a plastic film 14;
- neatly arranging the bundles of tubes so as to form stable bases, in order to create a package 15 of tube bundles 22, 32, 42 positioned on a series of supporting beams 16;
- preparing a series of simple beams 17 each above the package 15 in correspondence with each supporting beam 16;
- fastening the beams 16, 17 and package 15 with a strap compressing them to form a pallet 10.

Claims

1. A method for the production of a pallet (10) having a high stability and resistance for bundles of tubes, in particular tubes (23, 33, 43) for industrial, electrical, electronic and electro-technical applications, comprising the following phases:

   - preparing a series of tubes (23, 33, 43);
   - packaging said tubes into bundles (22, 32, 42) with a polygonal section by wrapping them with a plastic film (14);
   - neatly arranging the bundles of tubes so as to form stable bases, in order to create a package (15) of tube bundles (22, 32, 42) positioned on a series of supporting beams (16);
   - preparing a series of simple beams (17) each above the package (15) in correspondence with each supporting beam (16);
   - fastening the beams (16, 17) and package (15) with a metallic strap (18), compressing them to form a pallet (10).

2. The method for the production of a pallet (10) according to claim 1, wherein said bundles of tubes (22, 32, 42) have flat opposite surfaces (22a, 32a, 42a) which are suitably arranged horizontally by stacking the bundles starting from the rest base consisting of supporting beams (16).

3. The method for the production of a pallet (10) according to claim 1, wherein each of said bundles of tubes has substantially flat slanting surfaces (22b, 32b, 42b), arranged for providing a supporting surface for the corresponding slanting surfaces of the bundles positioned laterally side by side to form a package (15).

4. The method for the production of a pallet (10) according to claim 1, wherein said bundles (22) form a hexagon, with two horizontal surfaces (22a) and four slanting surfaces (22b).

5. The method for the production of a pallet (10) according to claim 1, wherein said bundles (32) form a pentagon, with two opposite horizontal surfaces (32a) for the stacking of superimposed bundles and connected at one end by two slanting surfaces (32b) and at the opposite end by a slanting surface (32b) which are used for the side supports between bundles (32) positioned side by side in the package (15).

6. The method for the production of a pallet (10) according to claim 1, wherein said bundles (42) form a trapezoid, with two opposite horizontal surfaces (42a) for the stacking of superimposed bundles and connected by two slanting surfaces (42b) which are used for the side supports between bundles (42) positioned side by side in the package (15).

Fig. 1

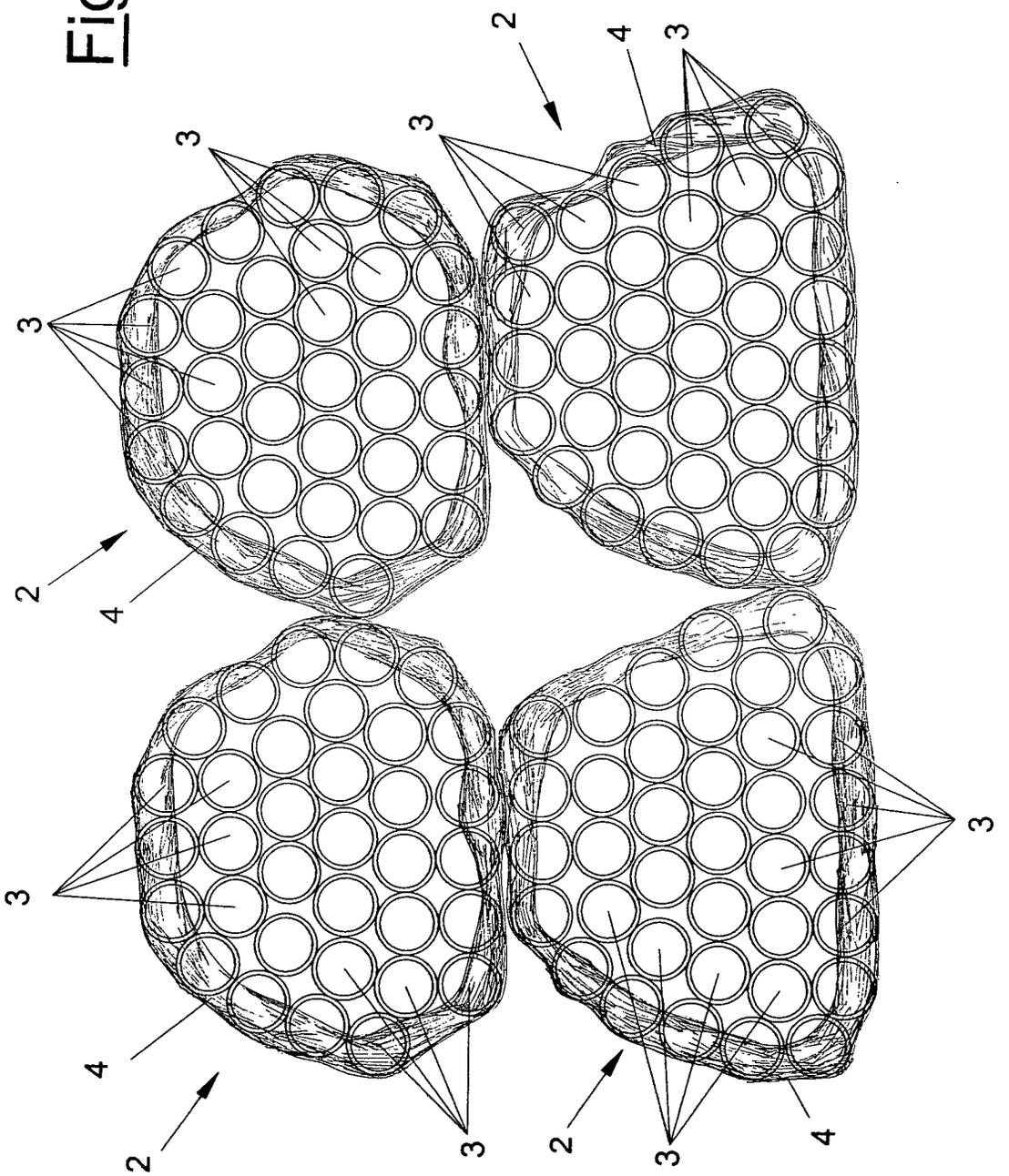


Fig. 2B

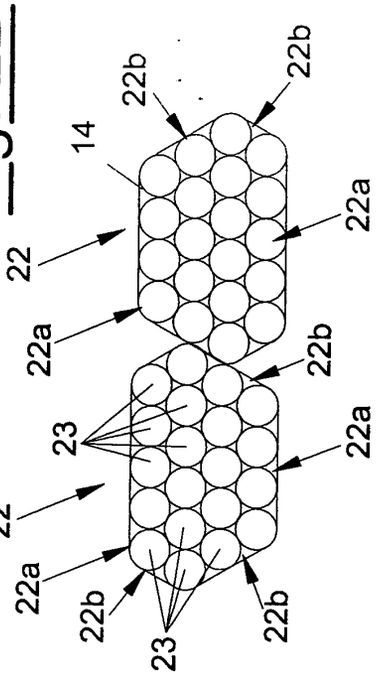


Fig. 2A

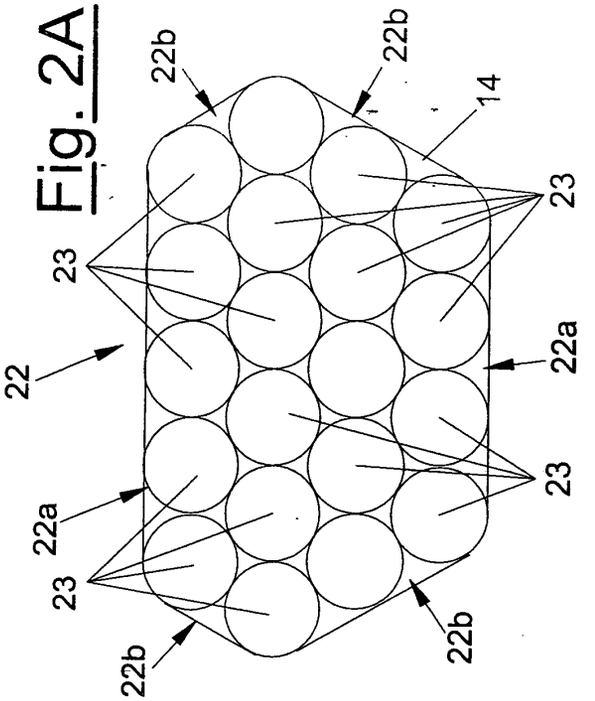


Fig. 2C

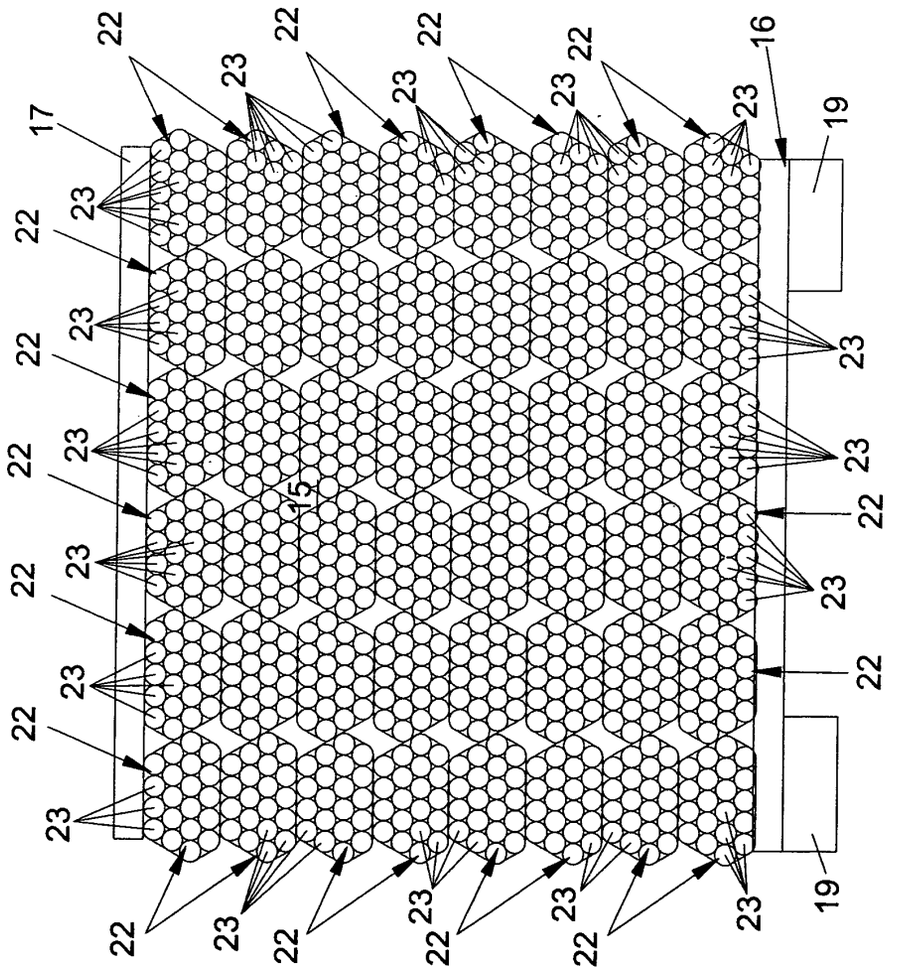


Fig. 3B

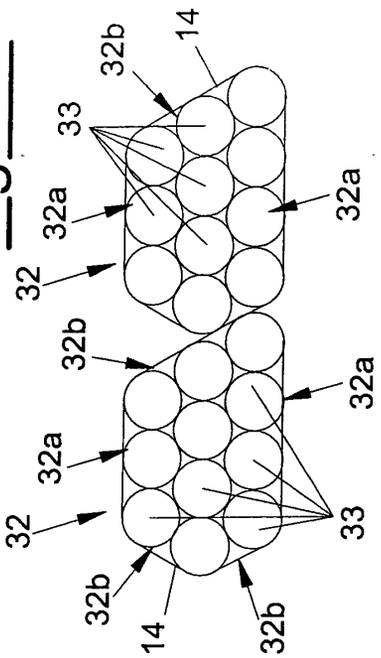


Fig. 3A

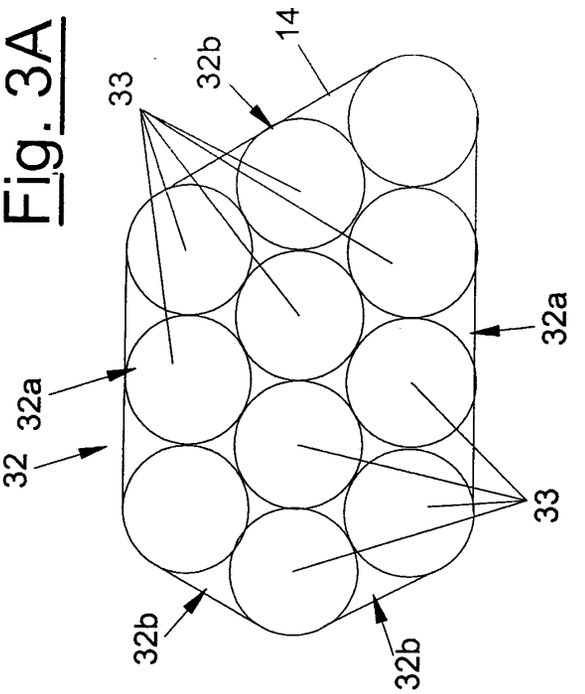


Fig. 3C

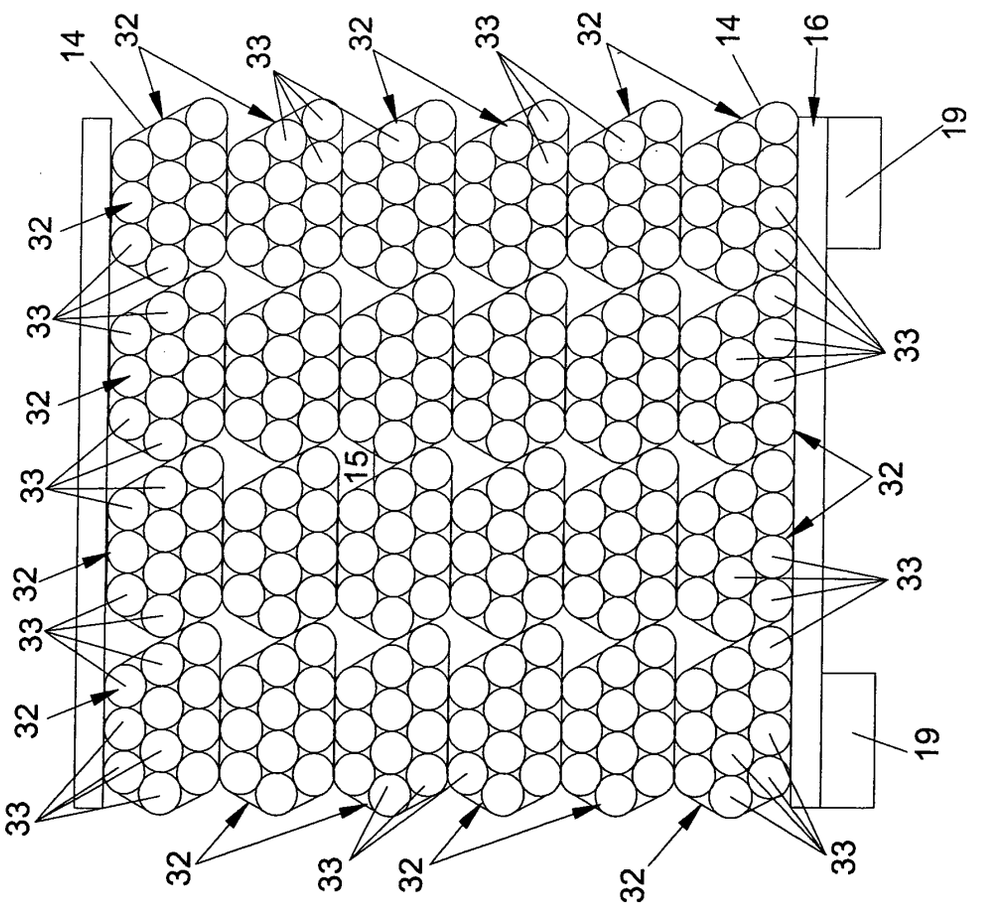


Fig. 4B

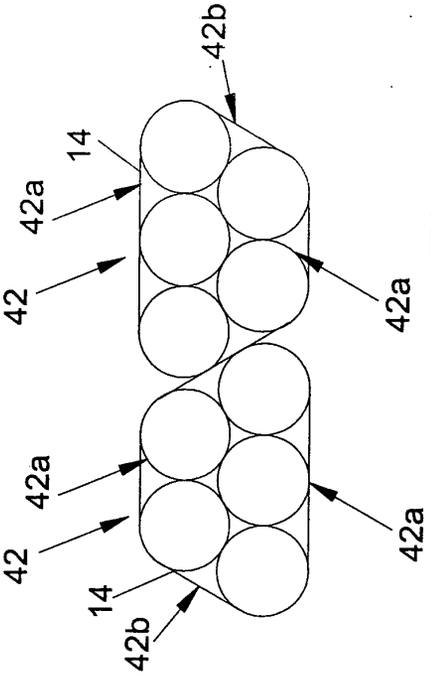


Fig. 4A

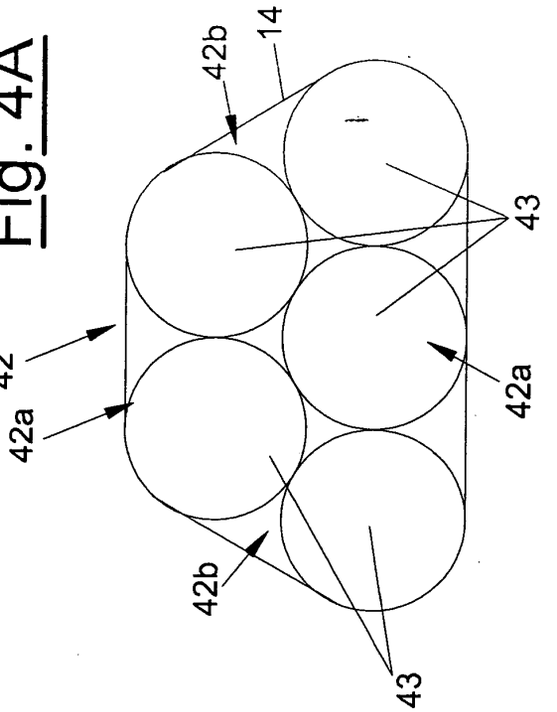
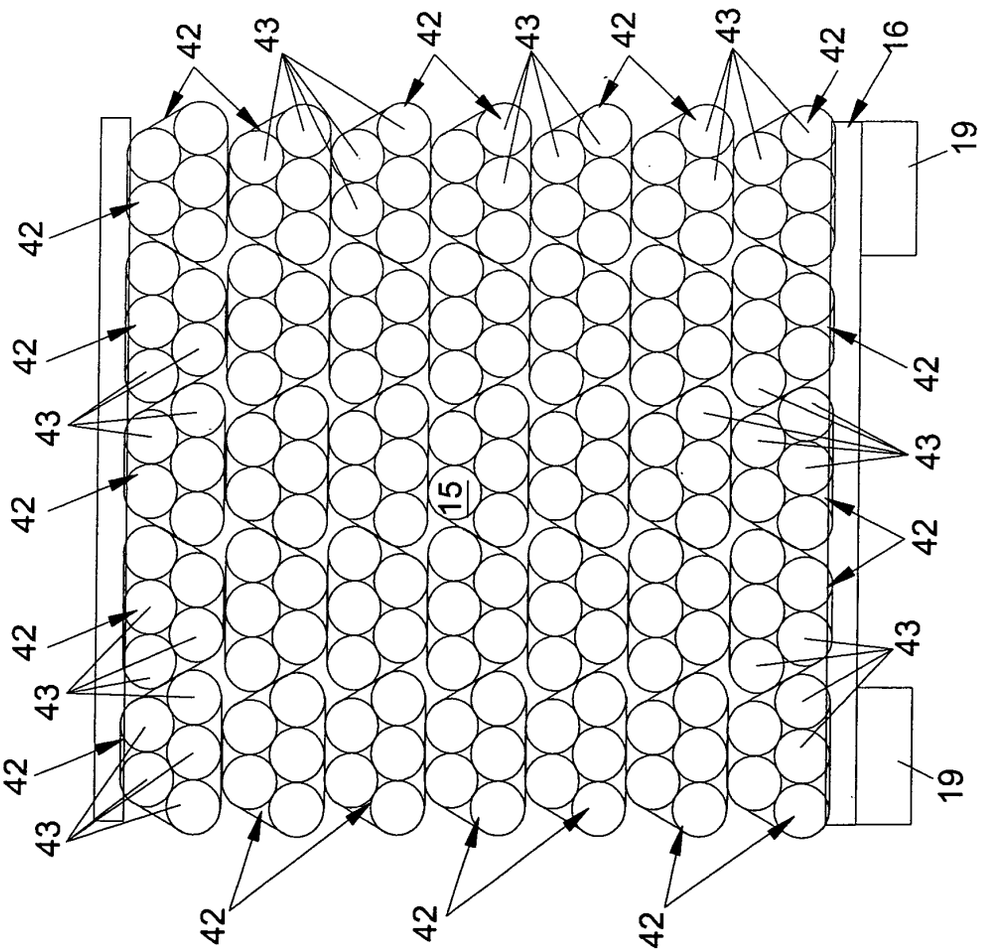


Fig. 4C



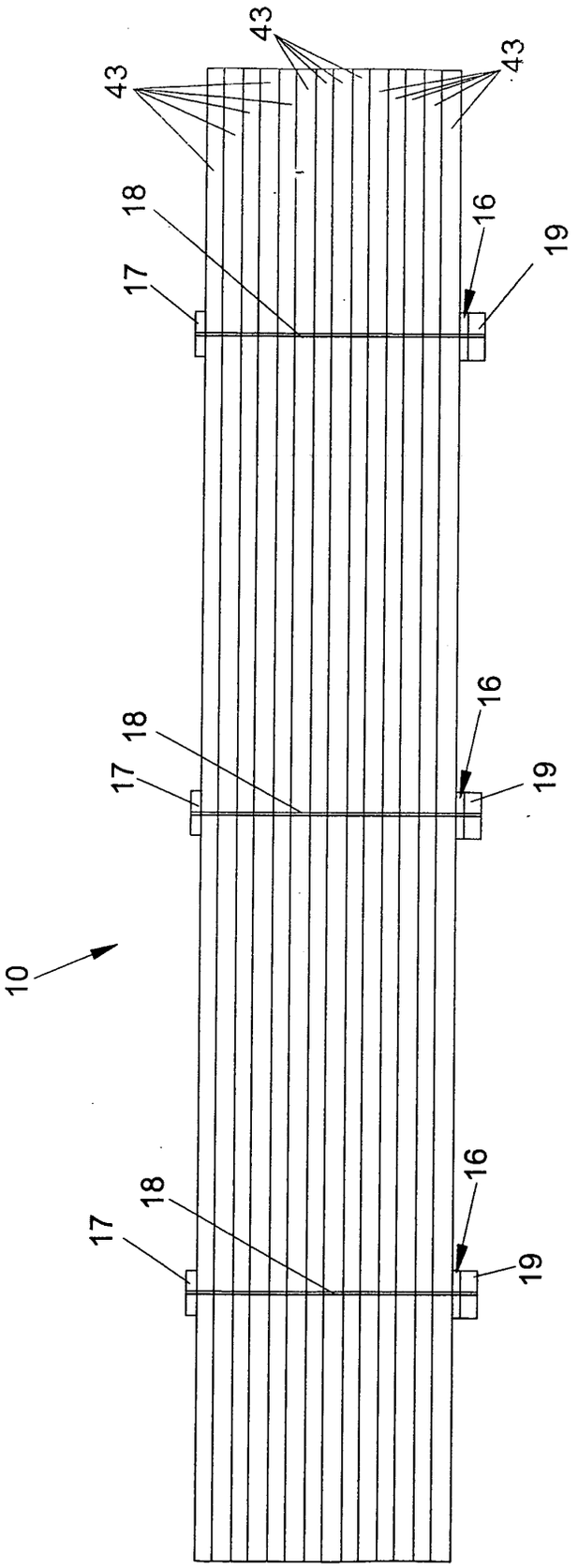


Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 05 07 5596

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 June 2005	Piolat, O

CATEGORY OF CITED DOCUMENTS

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