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(54) **Machine for artificial ageing of products for building purposes**

(57) The machine (1) brings about artificial ageing of products (2) for building purposes and comprises a path (3) along which the products (2) are channelled, and a station (7) for ageing of the products (2), which is defined along a stretch of the path (3). The main characteristic

of the present invention consists in the fact that the ageing station (7) comprises at least one rotating roller (13) with axis of rotation orthogonal to the direction of advance of the products (2) and at least one projection (18) made on the roller (7) and designed to come into contact with the products (2) in order to erode and hence age them.

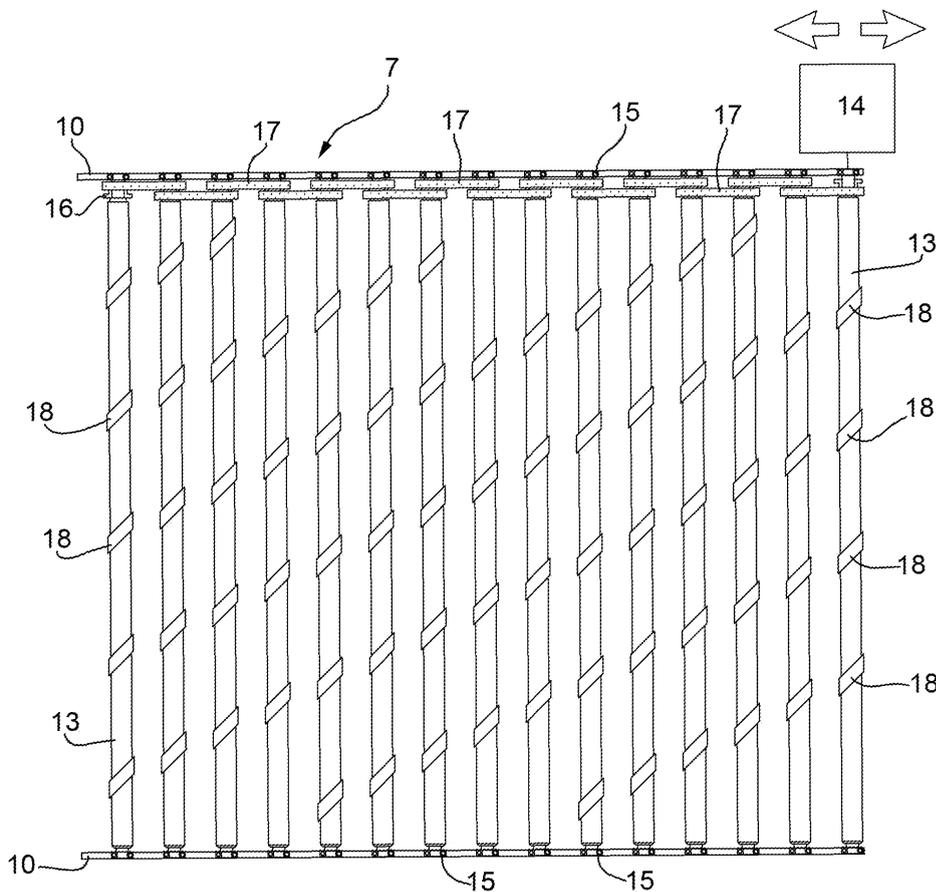


FIG.3

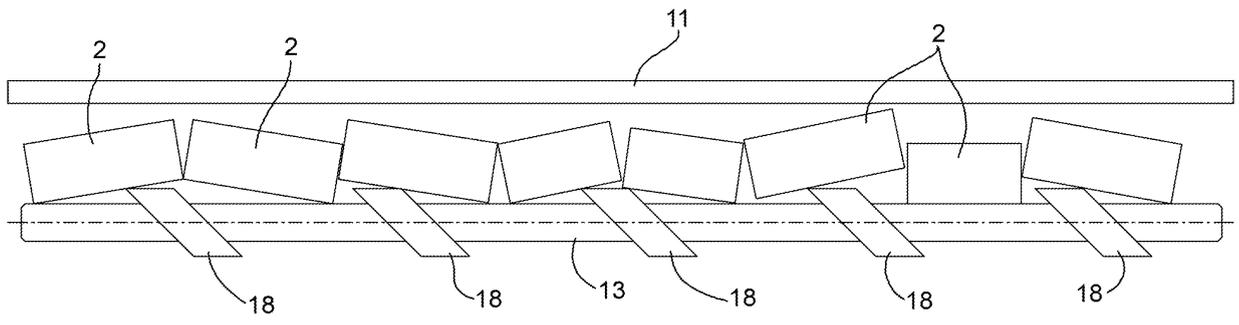


FIG.4

Description

[0001] The present invention relates to a machine for artificial ageing of products for building purposes, such as for example products made of cementitious conglomerate.

[0002] As is known, production plants for making products for the building sector comprise a station in which via a press a plurality of products are produced on a board, a curing area, and a packaging line. Increasingly, users, above all those involved in laying road floorings, call for products that are already aged, namely, products provided with defects such as rounded edges and scratches. Basically, products similar to the ones that have been laid in place for some time, and consequently ones presenting signs of wear, are required. For this reason, currently existing plants envisage, along the conveying line between the curing area and the packaging line, branching of a further conveying line, along which an ageing station is installed. A classic type of ageing station envisages that a board that carries a plurality of products is taken off the conveying line and made to pass under a plurality of percussion tools or hammers that come to strike on the surface of the products that is to remain in view. Said type of ageing station entails the drawback represented by having to move the products together with the production waste caused by the percussion tools. Furthermore, the ageing process marginally involves the edges of the product, which, instead, constitute precisely the areas of the product that should undergo the operation of artificial ageing to a greater extent. Finally, the ageing station envisages a dedicated conveying line, with consequent increase not only in the costs but also in the overall dimensions of the production plant.

[0003] The aim of the present invention is to provide a machine for ageing products for building purposes that will be free from the drawbacks referred to above and that in particular will envisage a simple, effective, and rapid system of ageing directly along the conveying line of the products from the curing station to the packaging station.

[0004] According to the present invention, a machine is provided for artificial ageing of products for building purposes of the type comprising a path along which said products are channelled and an ageing station for ageing said products, defined along a stretch of said path, **characterized in that** said ageing station comprises at least one rotating roller with axis of rotation orthogonal to the direction of advance of said products and at least one projection made on said roller and designed to come into contact with said products to erode and hence age them.

[0005] The present invention will now be described with reference to the attached drawings, which illustrate a preferred embodiment thereof and in which:

Figure 1 is a schematic view of a machine built according to the teachings of the present invention;

Figure 2 is a partial plan view of an assembly for conveying products;

Figure 3 is a plan view of an assembly for ageing products; and

Figures 4 and 5 are views from different angles and at an enlarged scale of the modalities of operation of the assembly of Figure 3.

[0006] With reference to Figure 1, designated as a whole by 1 is a machine for artificial ageing of products 2 for building purposes, said products 2 generally being made of cementitious conglomerate and having a prismatic shape.

[0007] The machine 1 comprises:

an annular path 3 along which the products 2 are channelled;
 a conveying line 4 (Figure 2) defined by a plurality of frames 5, positioned within which is a plurality of products 2, and
 by means 6 for movement of the line 4 along the annular path 3; and
 a station 7 for ageing of the products 2 defined along a rectilinear stretch of the path 3.

[0008] The annular path 3 is defined by an inner annular wall 8 and by an outer annular wall 11. In a way not illustrated, the outer annular wall 11 has a window designed to create an opening along the path 3 so as to enable removal of the products 2 that have already undergone artificial ageing.

[0009] With reference to Figures 3, 4 and 5, the ageing station 7 envisages, in a rectilinear stretch of the path 3, an opening 12 in the inner annular wall 8 and installation in said opening 12 of a plurality of rotating rollers 13 set parallel to one another and orthogonal to the direction of advance of the conveying line 4. The station 7 moreover comprises means 14 for controlling rotation of the rollers 13 about their own axis of rotation. In particular rotation of the rollers 13 occurs in use in a direction contrary to the direction of advance of the line 3 and hence of the products 2.

[0010] With reference to Figure 3, each roller 13 has its own axial ends supported, via a respective bearing 15, by corresponding side walls of the path 3. Fitted at one axial end of each roller 13 are two pinions 16. An annular chain 17 meshes on two pinions 16 of two adjacent rollers 13. In this way, the means 14 can be constituted by an electric motor designed to turn a roller 13 and thus, via this, all the other rollers 13.

[0011] With reference to Figures 3 and 4, each roller 13 has throughout its length a plurality of projections 18. In this example of embodiment, the projections 18 are distributed uniformly throughout the length of the roller 13 and are annular. Furthermore, the projections 18 in cross section have a parallelogram-shaped perimetral development in such a way that the line joining the minor sides of the cross section will be oblique with respect to

the axis of rotation of the roller 13. Preferably, the rollers 13 and the projections 18 are made of metal material, and the projections 18 are made of a single piece with the roller 13. It should be emphasized that the projections 18 of one roller 13 are staggered uniformly with respect to the projections 18 of the adjacent roller 13 so as to define a plurality of imaginary lines that join the projections 18 of the rollers 13 parallel to one another and are oblique with respect to the direction of advance of the products 2. The distance between two adjacent projections 18 of the same roller 13 is greater than the width of the product 2 of larger dimensions in such a way that said product 2 will come into contact with just one projection 18 of said roller 13 at a time, as illustrated in Figure 4. Represented in Figure 5, between the various rollers 13 are platforms 21, the top surface of which is at the same level as of the rollers 13. Said platforms 21 are installed to prevent products 2 that have a length shorter than the distance between two adjacent rollers 13 from falling down. Furthermore, the width of the platforms 21 is less than the width of the space defined between two adjacent rollers 13 so as to define slits between the platforms 23 and the rollers 13, through which the production waste drops down.

[0012] In use, while the conveying line 4 follows the annular path 3, each frame 5 passes with its own products 2 in a position corresponding to the ageing station 7, where the products 2 come into contact with the projections 18 of the various rollers 13 that turn in a direction contrary to the direction of advance of the products 2. The geometrical shape of the projections 18 and their positioning on the various rollers 13 causes the products 2 to come into contact with the sides and the sharp edges of the projections 18, and said contact simply has the effect of marring and hence eroding the surface of contact of the products 2, thus bringing about the ageing effect. In fact, on account of the staggering of the projections 18 in the adjacent rollers 13, contact of the projections 18 is made with the entire bottom surface of the product 2. Furthermore, owing to the staggering between the projections 18 of adjacent rollers 13 and the distance between the projections 18 of one and the same roller 13, the products 2 are arranged obliquely with respect to the axis of rotation of the rollers 13, and said position increases the effectiveness of the erosion. The stretch of outer annular wall 11 in a position corresponding to the station 7 prevents the products 2 from coming out of their own frame 5. Preferably, once the frame 5 has passed beyond the station 7, the means 6 reverse the direction of advance, and simultaneously the means 14 reverse the direction of rotation of the rollers 13 in such a way that rotation thereof will be always contrary to the direction of advance of the products 2. In this way, contact is made, by sliding, with the projections 18 of the entire bottom surface of the products 2. According to a different embodiment, in a station subsequent to the station 7, the products 2 could be taken out of the frame 5 and, after the set of the products 2 have been turned through 180°,

the products 2 are repositioned in the same frame 5 in such a way that, in a second passage in the station 7, the products 2 present with a front opposite to that of the previous passage. Furthermore, the machine 1 could be provided with a station subsequent to the station 7, where the products 2 could be turned upside down in such a way that in a second passage in the station 7 the products 2 present with a different surface for contact by sliding with the projections 18.

[0013] From what has been described above, the numerous advantages achieved by the present invention emerge clearly.

[0014] In particular, there has been provided a machine 1 of extreme simplicity, which brings about ageing of the products 2 rapidly (in one or two passes) and above all with a high degree of effectiveness. All this means that the machine 1 presents a markedly lower production cost as compared to the complex machines currently on the market. Basically, in addition to defining a better ageing effect and having a reduced production cost, the machine 1 reduces considerably the costs of production of the product 2. It should be emphasized that since the machine 1 presents an extreme simplicity and, as appears clearly, a high degree of solidity, it does not require particular operations of maintenance and hence has a longer service life than machines currently available on the market. The effectiveness of erosion of the products 2 to bring about their ageing is due to the contact between the products 2 and the projections 18. Now, on account of the staggering of the projections 18 in the adjacent rollers 13, there is obtained the absolute certainty that the edges and also the bottom surface of the product undergoes erosion, as illustrated in Figure 5. Furthermore, as illustrated in Figures 4 and 5, on account of the staggering between the projections 18 of adjacent rollers 13 and the distance between the projections 18 of one and the same roller 13, the products 2 during their passage in the station 7 undergo a slewing action, i.e., they are arranged obliquely with respect to the axis of rotation of the rollers 13 and this slewing action increases the effectiveness of the erosion on the edges.

[0015] Finally, it is clear that modifications and variations may be made to the machine 1 described and illustrated herein, without thereby departing from the sphere of protection of the present invention.

Claims

1. A machine for artificial ageing of products (2) for building purposes of the type comprising a path (3), along which said products (2) are channelled, and a station (7) for ageing of said products (2) defined along a stretch of said path (3), said machine being **characterized in that** said ageing station (7) comprises at least one rotating roller (13) with axis of rotation orthogonal to the direction of advance of said products (2), and at least one projection (18) made

on said roller (7) and designed to come into contact with said products (2) to erode and hence age them.

2. The machine according to Claim 1, **characterized in that** it comprises means (14) for controlling rotation of said roller (13) in a direction contrary to the direction of advance of said product. 5
3. The machine according to Claim 1 and/or Claim 2, **characterized in that** said roller (13) has a plurality of projections (18). 10
4. The machine according to Claim 3, **characterized in that** said projections (18) are distributed uniformly throughout the length of said roller (13). 15
5. The machine according to any one of the preceding claims, **characterized in that** said station (7) comprises a plurality of said rollers (13). 20
6. The machine according to Claim 5 depending upon Claim 4, **characterized in that** said projections (18) of one first said roller (13) are staggered with respect to said projections (178) of one said roller (13) adjacent to the first. 25
7. The machine according to any one of the preceding claims, **characterized in that** said projection (18) is annular. 30
8. The machine according to Claim 7, **characterized in that** said projection (18) in cross section has a parallelogram-shaped perimetral profile.
9. The machine according to any one of the preceding claims, **characterized in that** said projection (18) is made of rigid material. 35
10. The machine according to Claim 9, **characterized in that** said roller (13) is made of metal material. 40
11. The machine according to any one of the preceding claims, **characterized in that** it comprises a conveying line (4) defined by a plurality of frames (5), within which a plurality of said products (2) is positioned, and by means (6) for movement of said conveying line (4) along said path (3). 45
12. The machine according to any one of the preceding claims, **characterized in that** said path (3) is annular. 50

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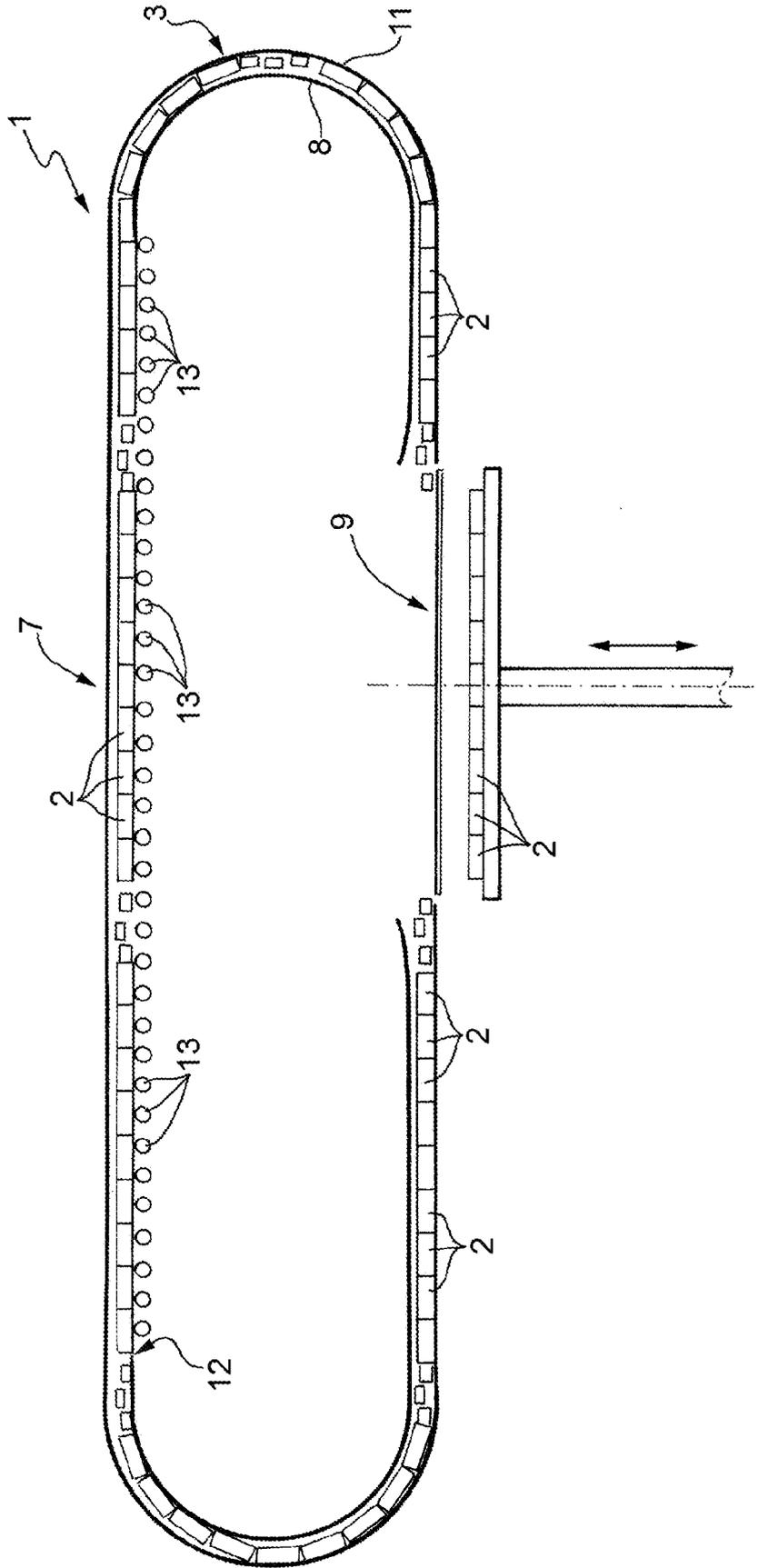


FIG.1

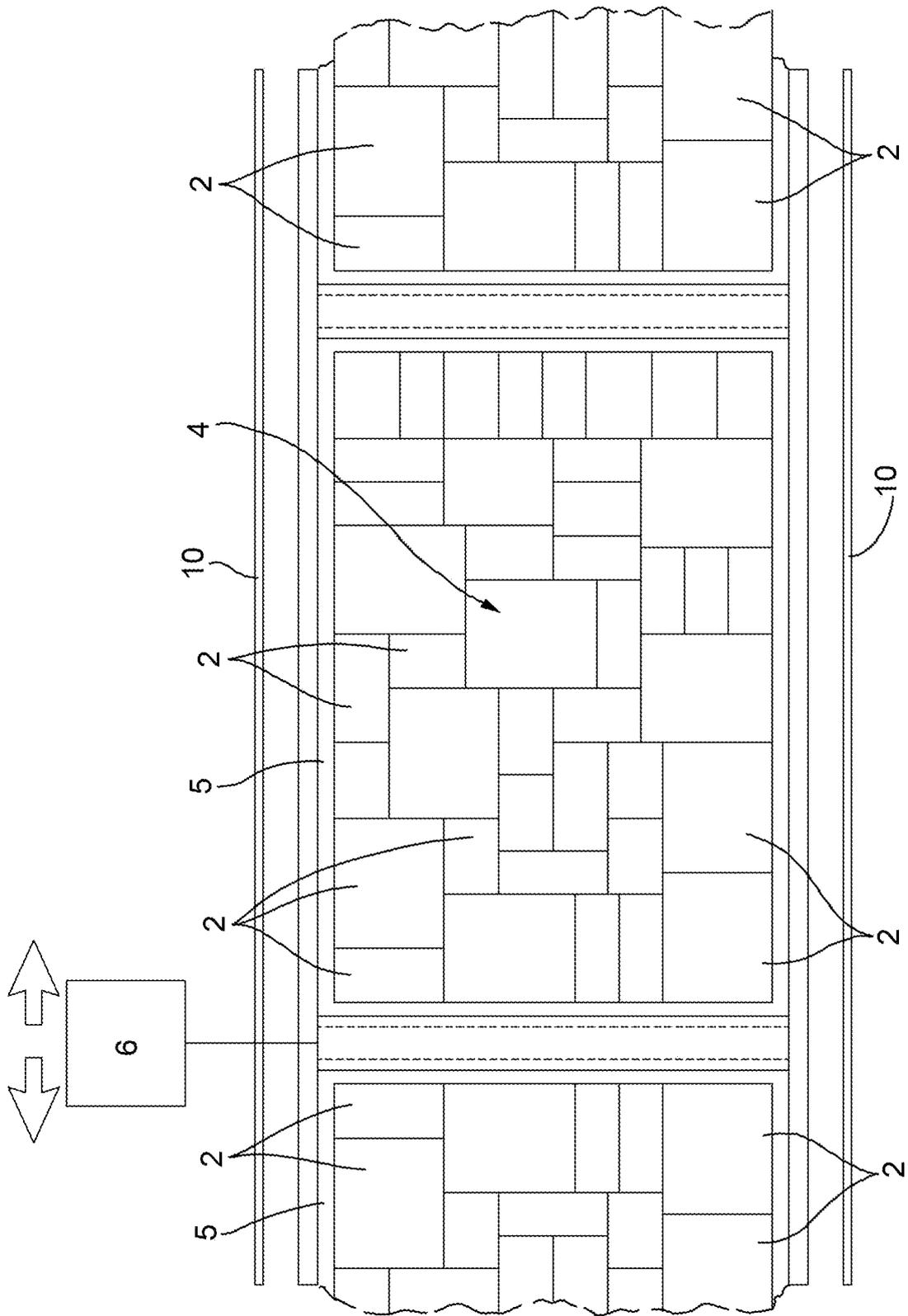


FIG.2

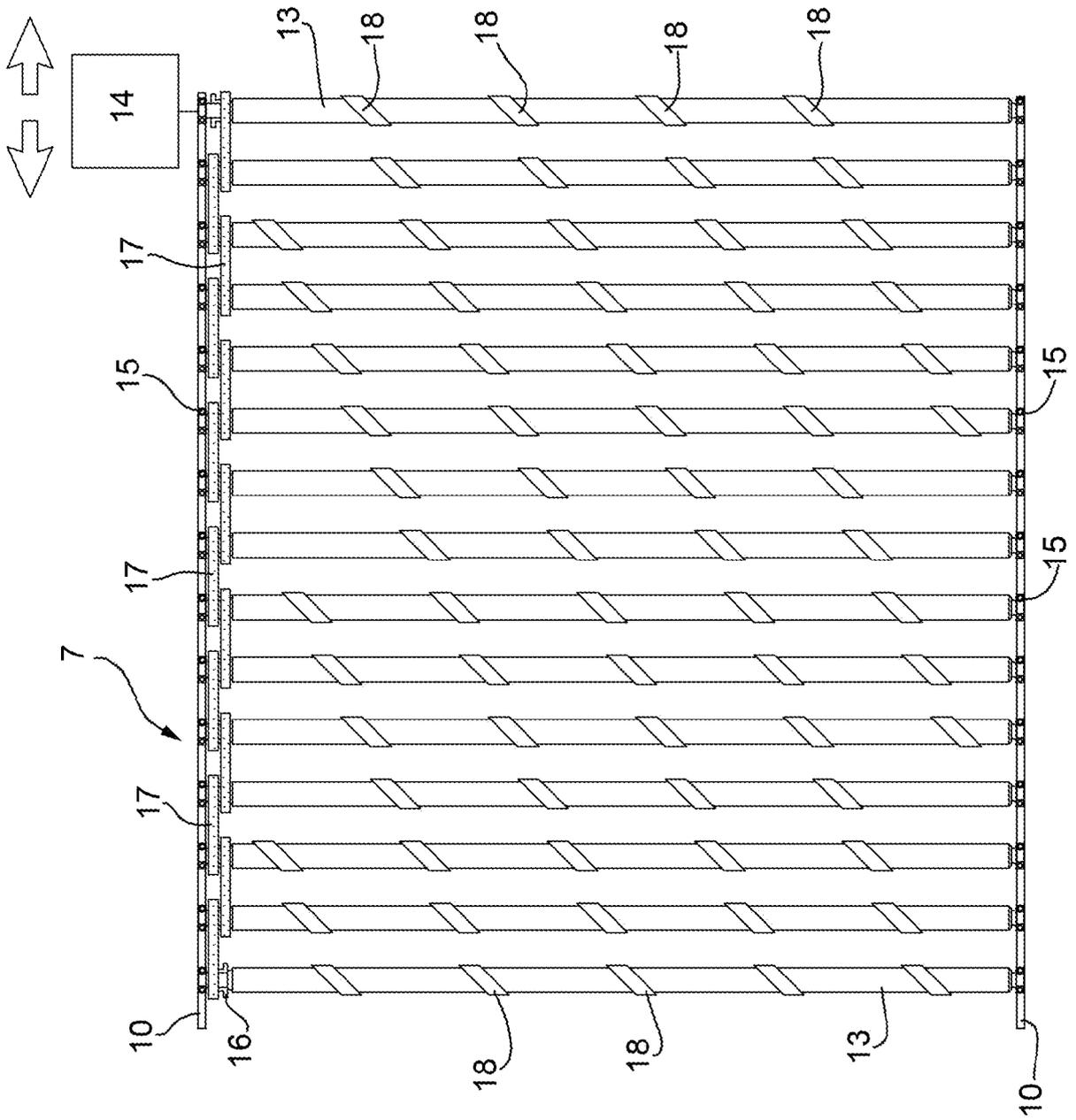


FIG.3

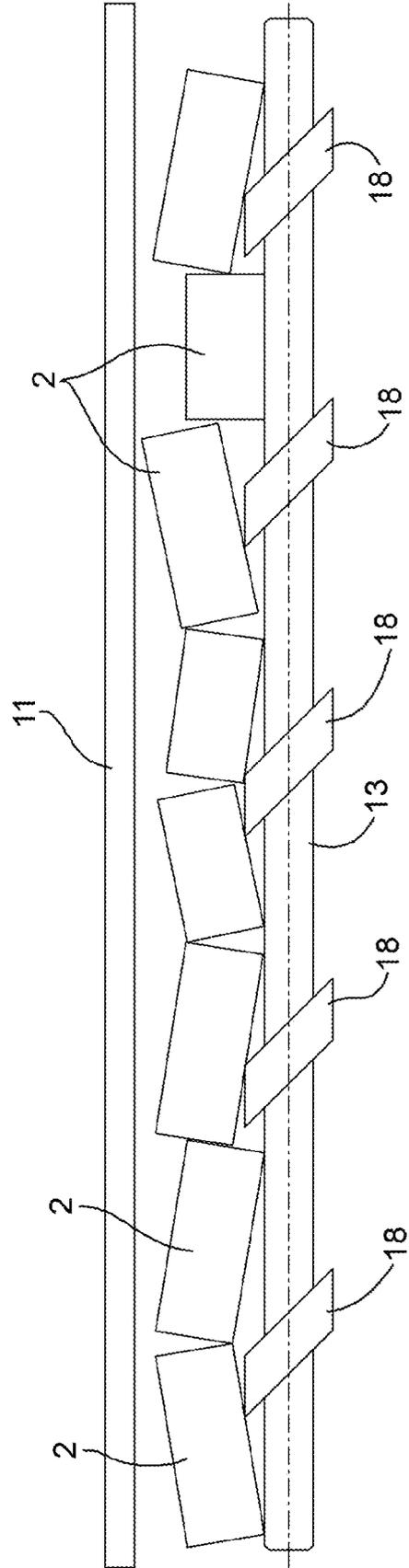


FIG.4

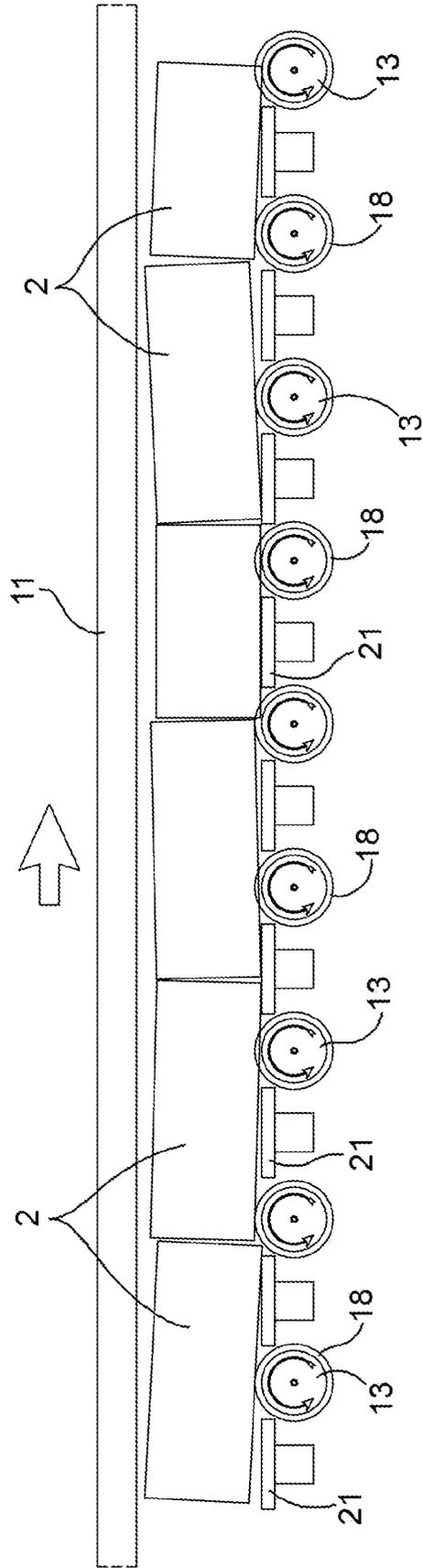


FIG.5



EUROPEAN SEARCH REPORT

Application Number
EP 09 16 2754

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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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
The Hague		23 September 2009	Vaglianti, Giovanni
CATEGORY OF CITED DOCUMENTS		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	
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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