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(71) Applicant: **Truck Training Center Italy S.R.L.**
25018 Montichiari (IT)

(72) Inventor: **Scolari, Battista**
25045 Castegnato (IT)

(74) Representative: **Alagem Modiano, Lara S. et al**
Modiano & Associati
Via Meravigli, 16
20123 Milano (IT)

(54) **Automatic covering element particularly for pits of mechanical workschops and the like**

(57) Automatic covering element particularly for pits of mechanical workshops and the like, comprising a shutter-like covering (3) which is guided so that it can slide within guides (7) arranged on the longitudinal edges of a pit (2) and the like and can be positioned in a storage region (10); motor means (30) are also provided for moving the shutter-like covering (3); the automatic covering element further comprises means (20) for the concertina positioning of the shutter-like covering (3) in the storage region (10).

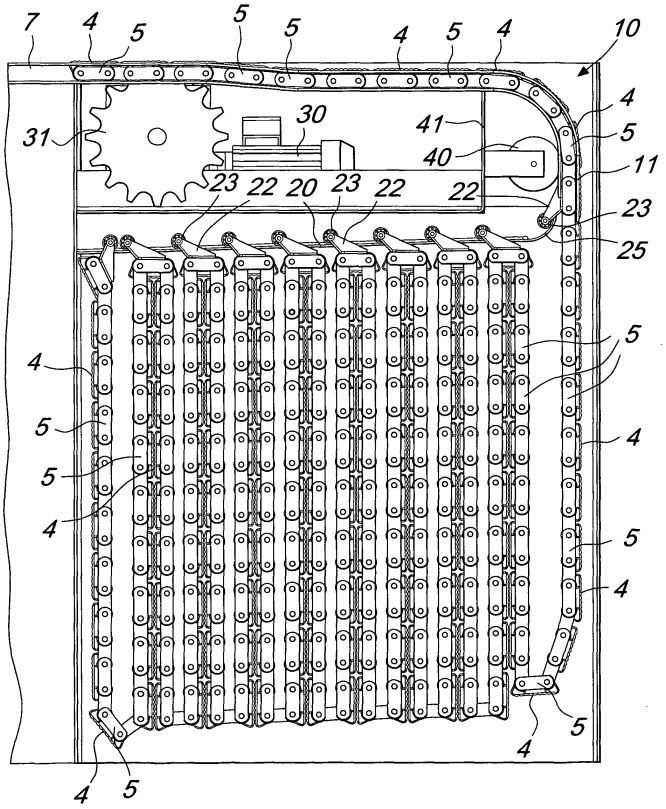


Fig. 5

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Description

[0001] The present invention relates to an automatic covering element particularly for pits of mechanical workshops and the like.

[0002] As is known, due to safety regulations, automatic coverings are currently used which are to be placed at pits of mechanical workshops and the like and are generally provided by a covering element constituted by a plurality of bars arranged side by side, which are made to slide by way of motor means which provide to cover the pit or, when the pit is to be used, store the covering element in an appropriately provided region located at the end of the pit, below the walking surface.

[0003] In current solutions, the covering element is stored in practice by substantially rolling it up in a spiral configuration, with the need to provide appropriate spiral guides which face each other at the end of the pit.

[0004] The provision of the spiral guides is not only constructively complicated but also suffers the drawback of causing difficulty in the spiral roll-up action, which is necessarily performed by pushing, with the risk of jamming especially in the case of considerably long pits.

[0005] Another problem further is that as the length of the pit varies, it is necessary to modify the length of the spiral, with significant increases in diameter which necessarily entail complex operations to provide the storage region.

[0006] The aim of the invention is to solve the problem described above by providing an automatic covering element particularly for pits of mechanical workshops and the like which can be adapted easily to any customer demand without having constructive complications if the length of the pit is changed.

[0007] Within this aim, an object of the invention is to provide an automatic covering element which can be stored without having to resort to spiral winding, consequently simplifying all the operations for provision and facilitating the sliding of the covering element.

[0008] Another object of the present invention is to provide an automatic covering element which, thanks to its particular constructive characteristics, is capable of giving the greatest assurances of reliability and safety in use.

[0009] Still another object of the present invention is to provide an automatic covering element particularly for pits of mechanical workshops and the like which can be obtained easily starting from commonly commercially available elements and materials and is also competitive from an economical standpoint.

[0010] This aim and these and other objects which will become better apparent hereinafter are achieved by an automatic covering element particularly for pits of mechanical workshops and the like, according to the invention, which comprises a shutter-like covering which is guided so that it can slide within guides arranged on the longitudinal edges of a pit and the like and can be positioned in a storage region, motor means being further provided for moving said shutter-like covering, characterized in that it comprises means for the concertina positioning of said shutter-like covering in said storage region.

[0011] Further characteristics and advantages of the present invention will become better apparent from the description of a preferred but not exclusive embodiment of an automatic covering element particularly for pits of mechanical workshops and the like, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of the covering element applied to a pit of mechanical workshops and the like;

Figure 2 is a schematic sectional view of the covering element, illustrating the motor means and the guiding means for storage;

Figure 3 is a view of the covering element during the initial step of concertina storage;

Figure 4 is a view of the detail of the positioning rollers which act in central regions of the width of the shutter-like covering;

Figure 5 is a schematic view, taken on a vertical plane, of the shutter-like covering completely arranged within the storage region;

Figure 6 is a view of the covering element with elements of the shutter-like covering removed in order to illustrate the positioning means which act on the shutter-like covering;

Figure 7 is a view of the covering element, illustrating the motor means;

Figure 8 is a perspective view of the covering element packed into the storage region.

[0012] With reference to the figures, the covering element, generally designated by the reference numeral 1, can be used to cover automatically pits 2 which are used typically in mechanical workshops and the like.

[0013] The covering element comprises a shutter-like covering, generally designated by the reference numeral 3, which is constituted by a plurality of transverse bars or slats 4, to the ends of which chain-link elements, designated by the reference numeral 5, are connected by respective pivots to form a chain and have, at each pivot 8 of the chain 9, rollers 6 which are guided slidingly within longitudinal guides 7 which lie at the longitudinal edges of the pit 2.

[0014] The covering element can slide within the guides 7, which have, at one end of the pit 2 where a storage region 10 is provided, a vertical guiding portion 11 which is open in a downward region and arranges the shutter-like covering along a substantially vertical plane.

[0015] A peculiar characteristic of the invention resides in that means are provided for the concertina arrangement, i.e. for the side-by-side positioning of flaps of the shutter-like covering in the storage region 10.

[0016] Such means are provided by a storage guide 20, which is arranged with a subhorizontal orientation so

as to be at a lower level at the end that lies opposite the end located proximate to the open end of the vertical guide portion 11.

[0017] At preset intervals on the links 5 of the chains 9 brackets 22 are provided, which support a storage roller 23 which is spaced with respect to the sliding plane of the chain formed by the links 5.

[0018] The storage roller 23 is designed to engage an inlet end 25, which is folded upwardly, of the storage guides 20, which acts as a guiding inlet, so that when the link 5 provided with the bracket 22 arrives at the guiding inlet portion 25 of the guide 20, the roller in practice is picked up, so that it follows the guide 20, and the chain formed by the links 5 is suspended, obtaining a concertina or flap packing of the shutter-like covering.

[0019] To actuate the shutter-like covering, motor means are provided which are constituted by a motor 30 which drives a pair of pinions 31 which mesh between the rollers 6 of the chain 9, consequently moving the bars which provide the shutter-like covering.

[0020] With the described arrangement, therefore, when the chain links 5 reach the storage region at the end of the longitudinal guides 7, they are arranged on a vertical plane due to the presence of the portion 11, and the presence, at preset portions, of the bracket 22 with the storage roller 23 causes only that link to engage the guides 20, so that the chain and the bars supported by the chain arrange themselves in concertina fashion, i.e. in a side-by-side flap configuration, achieving an easy packing in the storage region, so that the shutter arranges itself in side-by-side sections which can be packed easily, not in a spiral fashion as instead occurs in the solutions of the background art.

[0021] In order to guide the shutter-like covering 3 in the portion in which it leaves the vertical guides 11, positioning rollers 40 are provided, which have an adjustable position, act on a central portion of the length of the bars 4 and are supported by the frame 41, which is connected to the fixed structure and supports internally the motor means 30 and externally the storage guides 20.

[0022] The rollers 40 are designed to keep the bars guided, preventing their incorrect positioning during their concertina or suspended flap arrangement.

[0023] From what has been described above, it is therefore evident that the invention achieves the proposed aim and objects, and in particular the fact is stressed that an automatic covering element is provided which, thanks to the presence of the storage rollers 23, allows in practice to disengage the bars which constitute the shutter-like covering element from the guides, allowing the chain to arrange itself in a concertina fashion, thus achieving easy and automatic packing, without forcing and without having to push to pack the flaps, since packing occurs automatically due to the inclination of the storage guides 20 which facilitate packing.

[0024] Another important aspect further resides in that as the length of the covering varies, it is not necessary to carry out particular modifications, since the length of the shutter-like covering which can be stored can be changed simply by modifying the height of the storage region and the distance between the brackets 22 and the roller 23.

[0025] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0026] All the details may further be replaced with other technically equivalent elements.

[0027] In practice, the materials used, as well as the dimensions of the contingent shapes, may be any according to requirements.

[0028] The disclosures in Italian Patent Application No. MI2006A000829 from which this application claims priority are incorporated herein by reference.

[0029] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An automatic covering element particularly for pits of mechanical workshops and the like, comprising a shutter-like covering (3) which is guided so that it can slide within guides (7) arranged on the longitudinal edges of a pit (2) and the like and can be positioned in a storage region (10), motor means (30) being further provided for moving said shutter-like covering, **characterized in that** it comprises means (20) for the concertina positioning of said shutter-like covering (3) in said storage region (10).

2. The covering element according to claim 1, **characterized in that** said shutter-like covering (3) comprises a plurality of transverse bars or slats (4), to the ends of which chain link elements (5) are connected.

3. The covering element according to the preceding claims, **characterized in that** it comprises, at each pivot (8) of said chain (9), rollers (6) which are guided slidingly within said guides (7).

4. The covering element according to one or more of the preceding claims, **characterized in that** said guides (7), at said storage region (10), form a portion of a vertical guide (11) which is open downwardly.

5. The covering element according to one or more of the preceding claims, **characterized in that** said means for concertina arrangement comprise a storage guide (20), which is arranged below the open end of said vertical guide portion (11), mutually

spaced storage rollers (23)associated with said shutter-like covering (3) being engageable with said storage guide (20).

6. The covering element according to one or more of the preceding claims, **characterized in that** it comprises brackets (22) which are connected to said links (5) and support said storage roller (23).

7. The covering element according to one or more of the preceding claims, **characterized in that** said storage guide (20) has a subhorizontal orientation, with the lower level at the opposite end with respect to said vertical guide portion (11).

8. The covering element according to one or more of the preceding claims, **characterized in that** it comprises, at the end of said storage guide (20) which is directed toward said vertical guide portion (11), a guiding inlet portion (25) which is folded upwardly for engagement with said storage roller (23) during the step for the retraction of said shutter-like covering (3).

9. The covering element according to one or more of the preceding claims, **characterized in that** said motor means comprise a motor (30) which drives a pair of pinions (31) which mesh between the rollers (6) of said chain links (5).

10. The covering element according to one or more of the preceding claims, **characterized in that** it comprises positioning rollers (40) which can engage a central portion of the length of said bars (4) of said shutter-like covering (3) in the portion where the bars (4) leave said vertical guide portion (11).

11. The covering element according to one or more of the preceding claims, **characterized in that** said positioning rollers (40) are arrangeable in adjustable positions

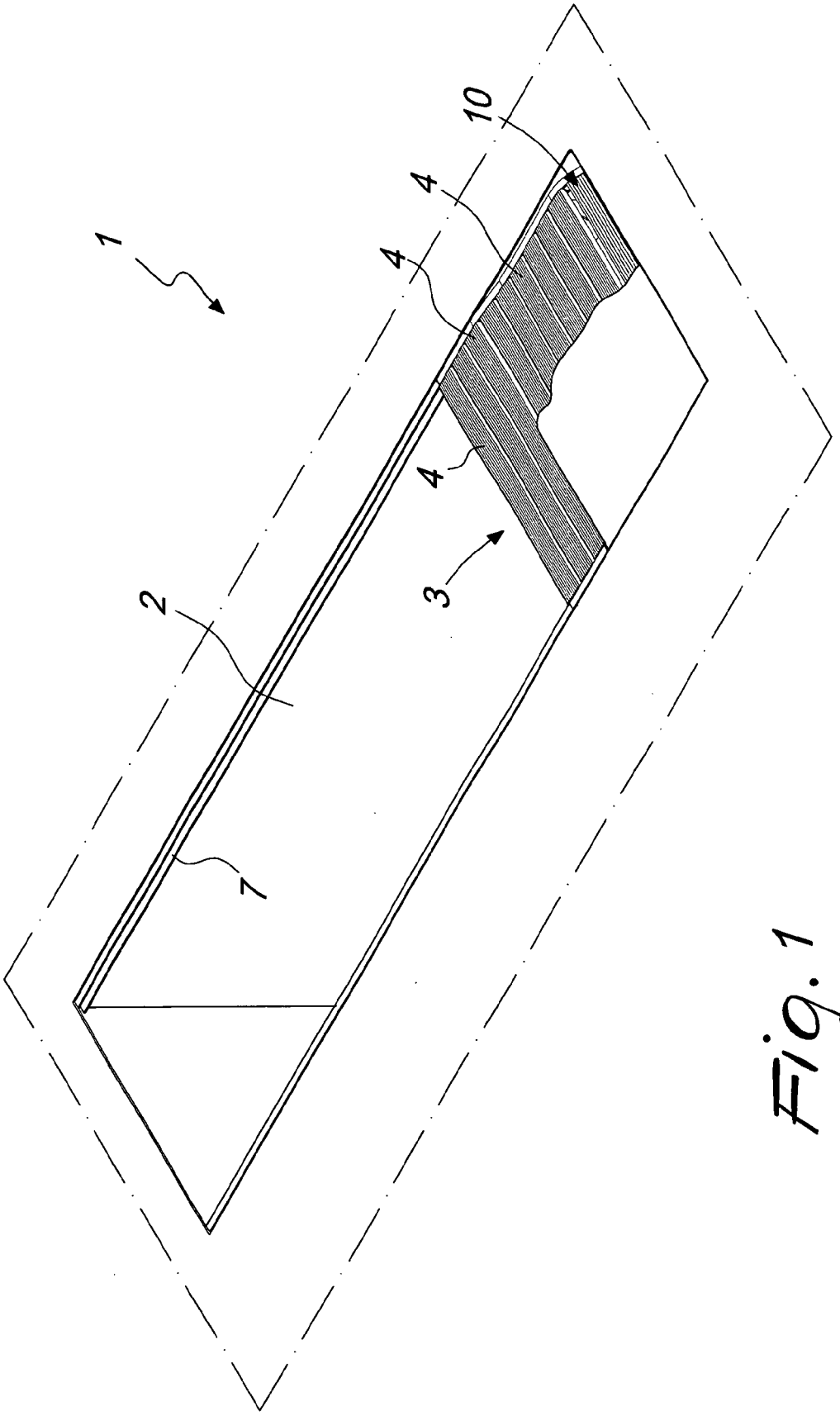


Fig. 1

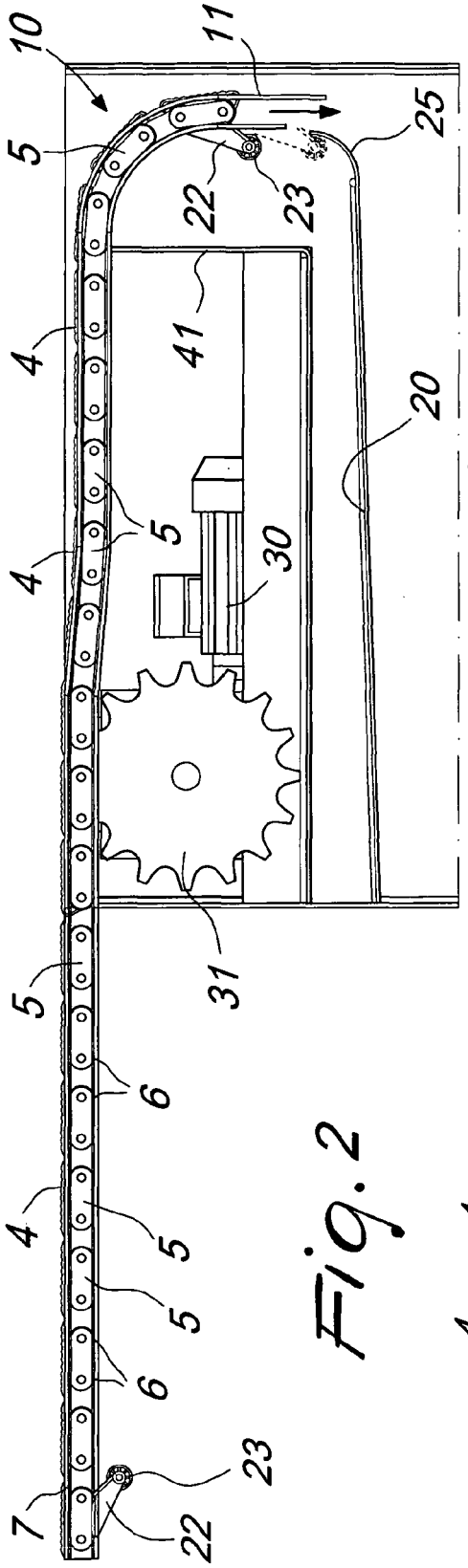

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Fig. 2

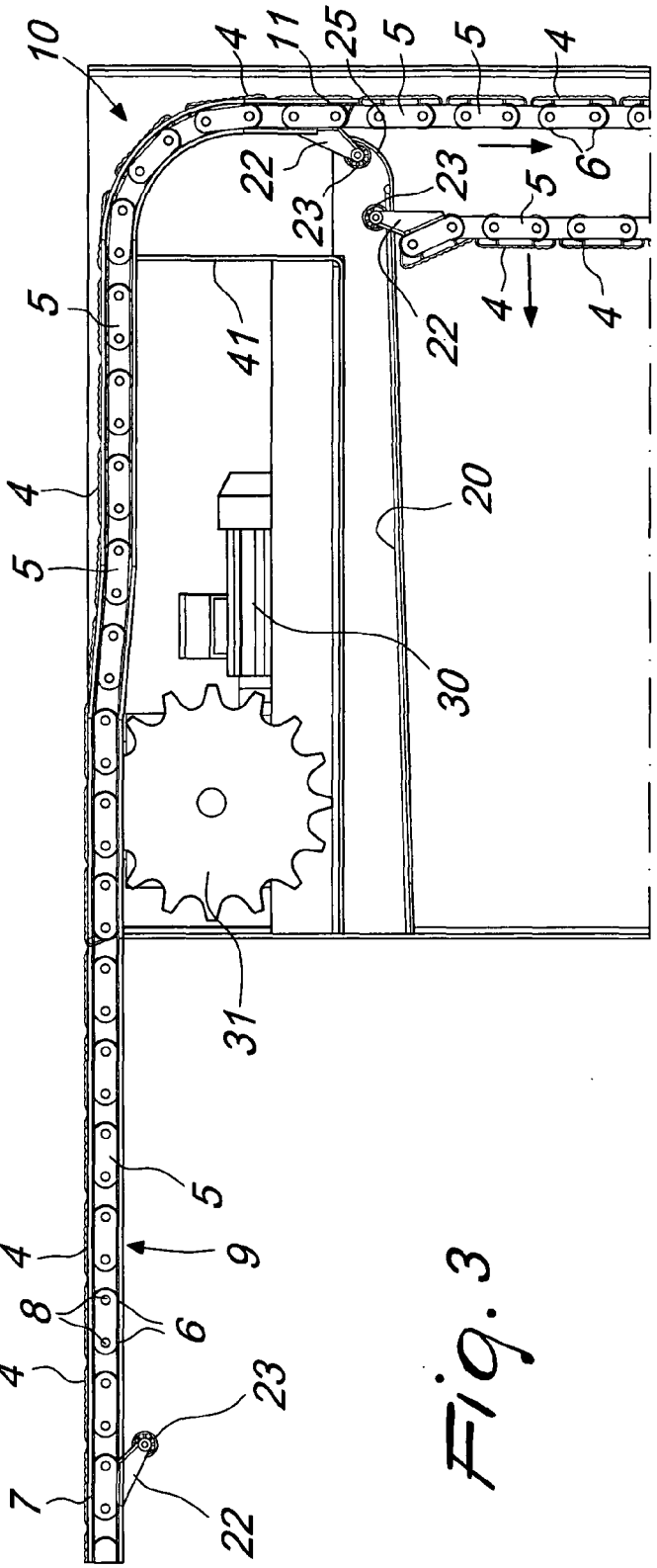

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Fig. 3

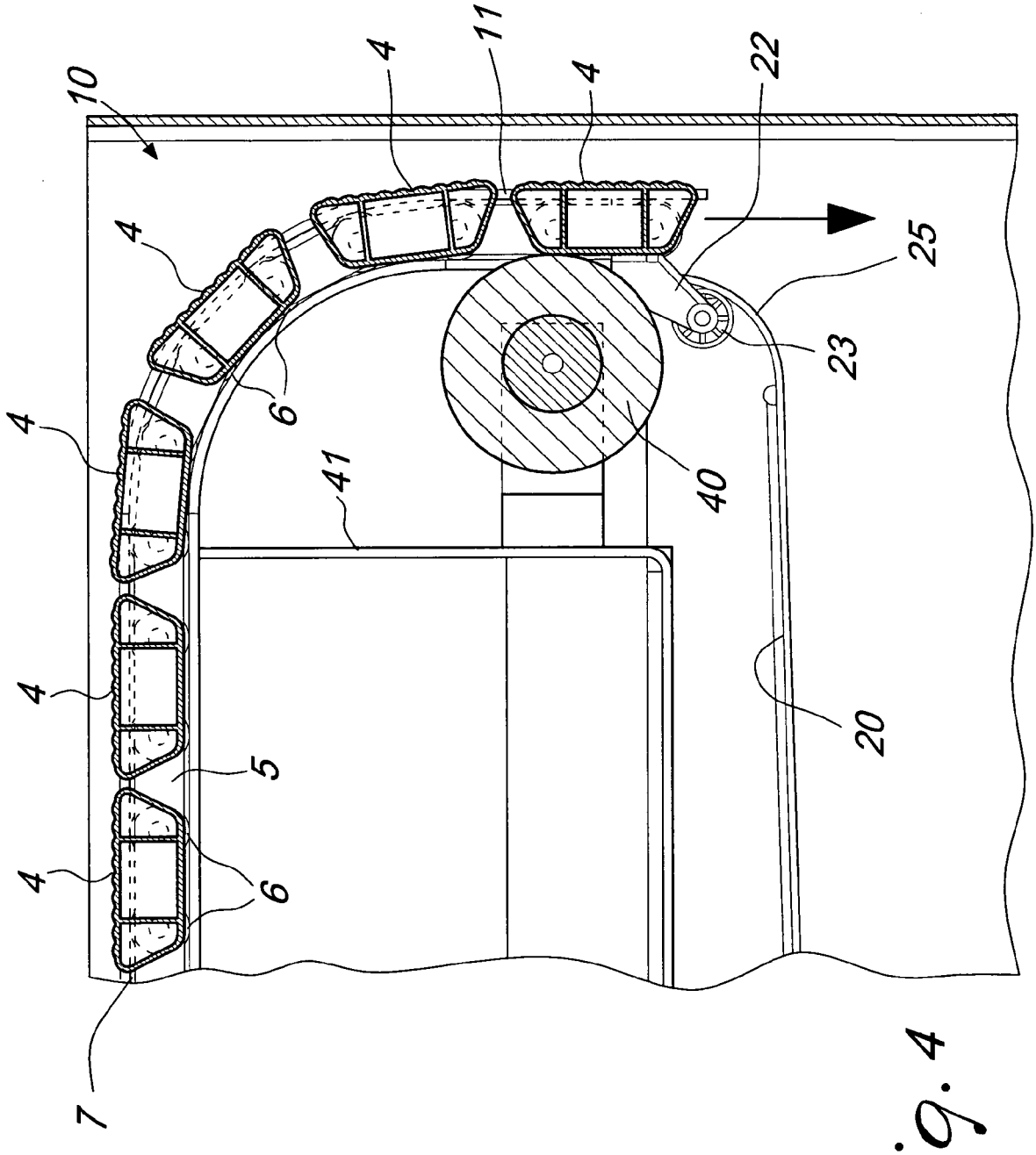


Fig. 4

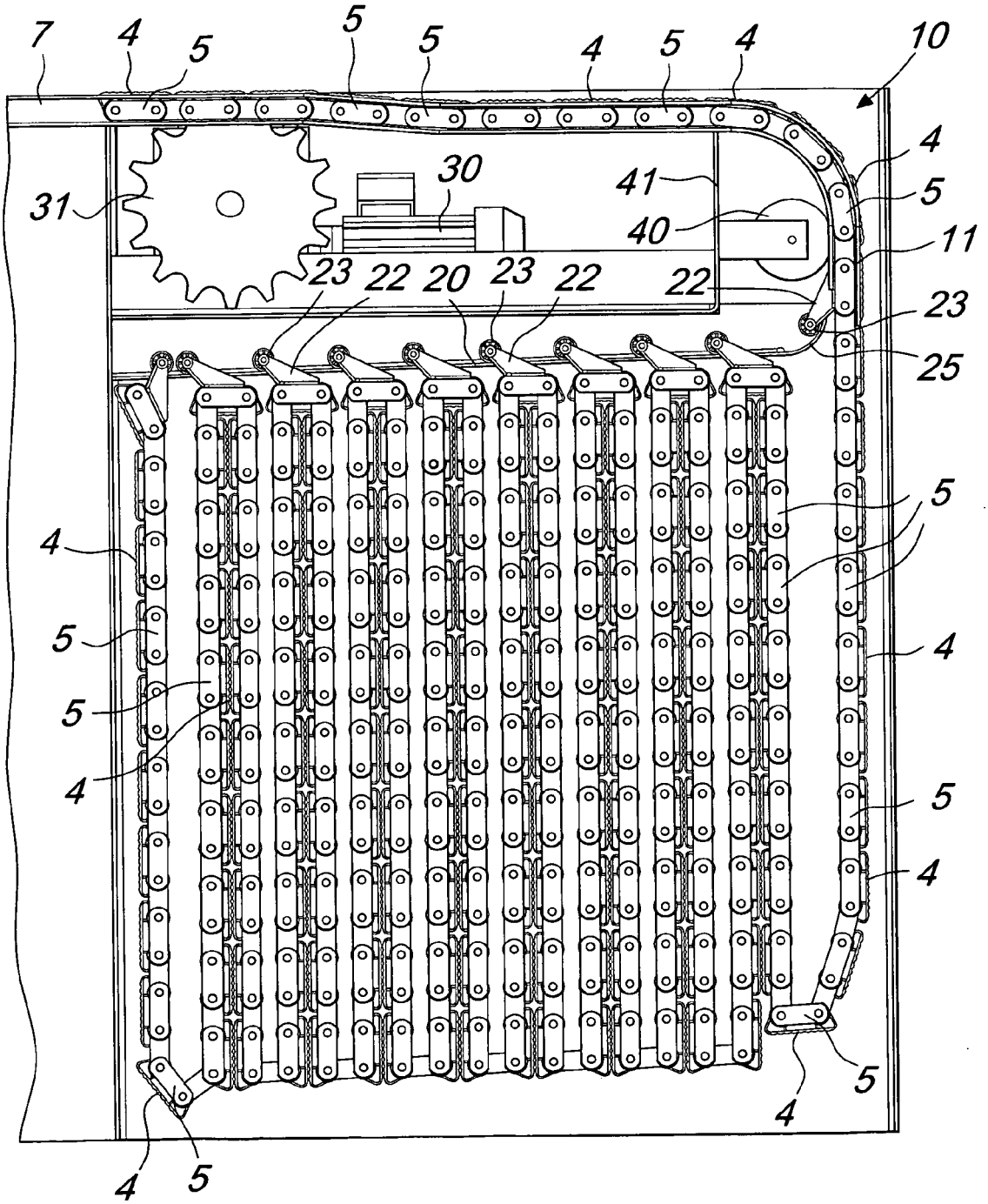

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Fig. 5

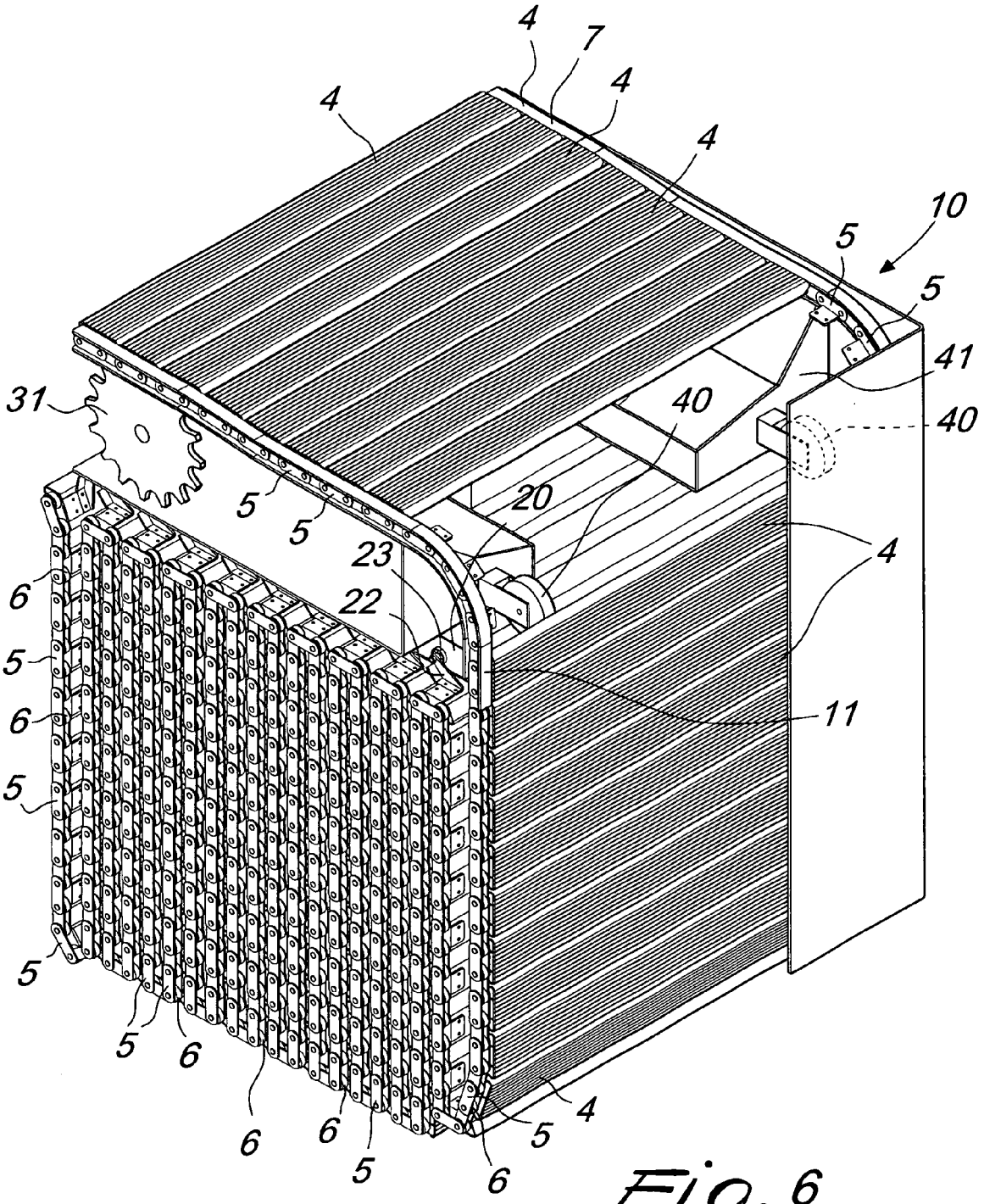


Fig. 6

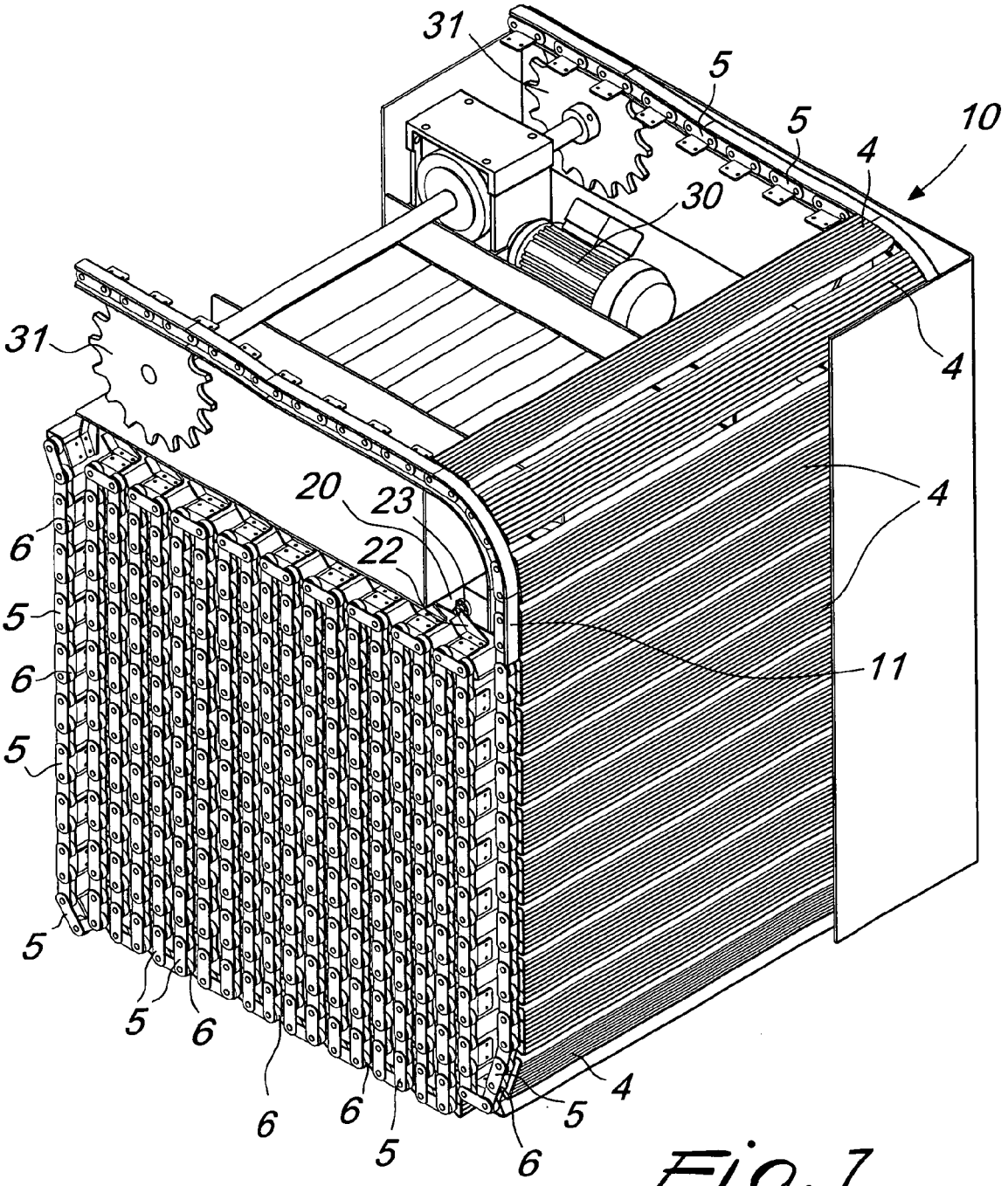


Fig. 7

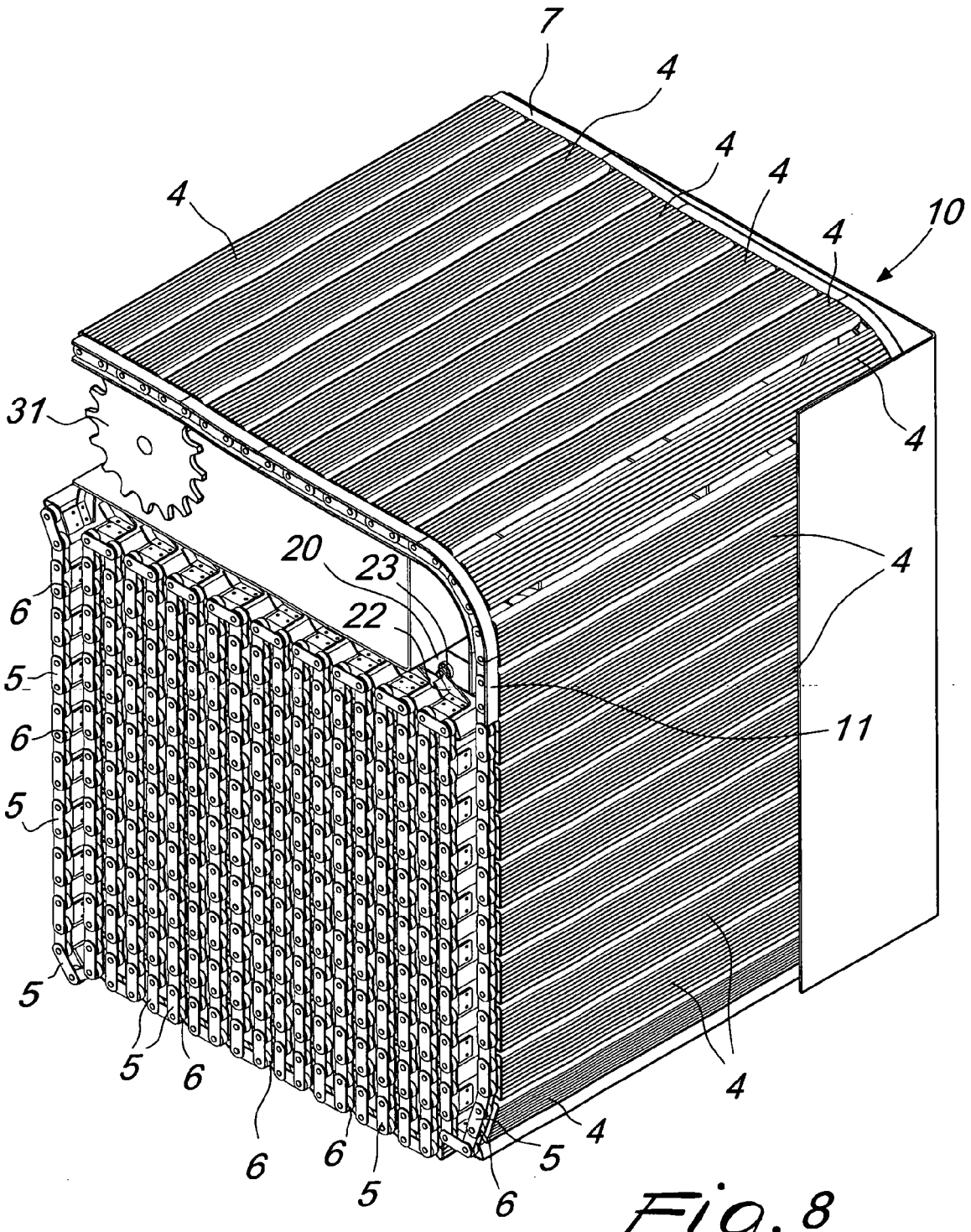


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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