(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 183 308**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **85201856.3**

(22) Date of filing: **12.11.85**

(51) Int. Cl.⁴: **F 26 B 25/10**
F 26 B 9/06, F 26 B 21/00

(30) Priority: **14.11.84 NL 8403473**

(43) Date of publication of application:
04.06.86 Bulletin 86/23

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(71) Applicant: **Gebroeders Rook Beheer B.V.**
Ijsseldijk 351
NL-2922 BK Krimpen a/d Ijssel(NL)

(72) Inventor: **Rook, Adrianus**
Sportsingel 14
NL-2924 XN Krimpen aan de Ijssel(NL)

(74) Representative: **Noz, Franciscus Xaverius, Ir. et al,**
Boschdijk 155 P.O. Box 645
NL-5600 AP Eindhoven(NL)

(54) **Air duct.**

(57) Air duct formed by a plate-shaped element provided with passages, having a curved course in cross-section and a corrugated course in longitudinal section, whereby rectangular slotted holes have been provided only in the tops of the corrugations in those portions of the plate-shaped element which join the boundary edges of said plate-shaped element that rest on the floor.

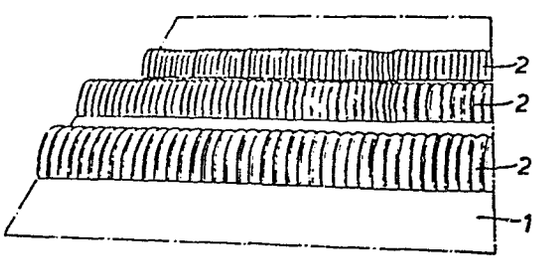

Fig.1.

Croydon Printing Company Ltd.

AIR DUCT

The invention relates to an air duct formed by a plate-shaped element provided with passages, having a curved course in cross-section and a corrugated course in longitudinal section.

Such air ducts are usually placed on the floor in a storage room in such a manner that the boundary edges of the curved plate-shaped element rest on the floor. Usually several such ducts, which can be built up from sections, are thereby arranged in a storage room at some distance of and parallel to each other. Products to be dried, cooled and/or ventilated can then be brought into the storage room such that said products are deposited in a heap above and between the air ducts. For drying, cooling and/or ventilating the products air can be supplied to the air ducts continuously or intermittently, which air, whether or not heated, can escape from the air duct via the passages in the plate-shaped element and stream along the products to be treated.

For the use of such air ducts for drying grains plate-shaped elements are usually provided, which are provided with small perforations over their entire surface. For bigger tuberous or bulbous crops, such as e.g. potatoes, onions and the like such air ducts proved to be unsatisfactory. In connection with this it has been proposed to provide those portions of the plate-shaped elements which join the boundary edges of the plate-shaped elements that rest on the floor with regularly spaced holes with a circular section. Also with such an arrangement, however, no satisfactory results were achieved.

According to the invention now rectangular slotted holes have been provided only in the tops of the corrugations in those portions of the plate-shaped element that join the boundary edges of the plate-shaped element which rest on the floor.

Surprisingly it has appeared that the use of such a construction effects a considerably improved operation with regard to drying, cooling and/or ventilating in comparison with the constructions described hereinabove, whilst in addition, because of the provision of holes only in the tops of the corrugations, a robust construction of the plate-shaped element is maintained, so that said plate-shaped element can take comparatively great loads, caused by products lying on the plate-shaped element.

The invention will be further explained hereinafter with reference to embodiments of the construction according to the invention diagrammatically illustrated in the accompanying figures.

Fig 1 is a diagrammatic perspective view of a few adjacently arranged air ducts.

Fig 2 is a diagrammatic view of the end of an air duct.

Fig 3 is a top view of a plate-shaped element intended for forming an air duct according to the invention.

Fig 4 is a side view of fig 3.

Fig 5 is a top view of a second embodiment of a plate-shaped element suited for forming an air duct according to the invention.

Fig 1 illustrates a few air ducts 2 located adjacent to each other on a bottom 1, which ducts have been arranged parallel to each other. As will be apparent from figs 1 and2 the air ducts have, in cross section, a curved, usually semicircular shape, whilst seen in longitudinal section an air duct has a corrugated course. Usually the ducts are thereby made of metal sheet, but of course it will be conceivable to use other materials for this purpose, such as e.g. plastic material. An air duct can be made of a single plate-shaped part, but in particular with longer air ducts a duct will usually be built up from sections which overlap each other at their ends. Such an air duct or a section of an air duct can be formed by bending a corrugated sheet 3 as illustrated in figs 3 and 4 around its longitudinal axis extending parallel to its boundary edges 4 and 5. As further appears from fig 3 slotted holes 7 have been provided in the tops 6 of the corrugations in the portions of the corrugated sheet joining the boundary edges 4 and 5 in such a manner that the longitudinal axes of said slotted holes coincide with the longitudinal axes of the corrugations and are therefore per-

pendicular to the boundary edges 4 and 5. In the bottoms 8 of the corrugations no holes have been provided, as will be apparent from figs 3 and 4.

As will further appear from fig. 3 the slotted holes 7 located nearest to the boundary edges 4 and 5 lie in a line in the corrugation tops 6 located adjacent to each other, whilst the slotted holes located further away from the boundary edges 4 and 5 in a pair of adjacent corrugation tops 6, seen in the longitudinal direction of the boundary edges 4 and 5, are staggered relatively to each other. As a result of this a better spreading of the air coming out of the air duct via the slotted holes is achieved as well as a better resistance of the air duct to collapsing.

In practice it has appeared that thereby efficient ventilation, drying, cooling or the like can be achieved when five slotted holes are provided in every corrugation top, whereby the length of such a slotted hole is preferably 55 mm and the width 20 mm. With an air speed of 6-7 m per second the occurrence of turbulence when the air streams out of the slotted holes appears to be prevented, as a result of which an equal stream of the air through the material to be treated will be achieved.

With a diameter between ± 1200 mm and 1600 mm of the corrugated sheet bent into a semicircle around its longitudinal axis the centre distance between a pair of rectangular slotted holes located in a corrugation top 6 will preferably be ± 130 mm, except for those slotted holes which have been arranged comparatively closely together near the boundary edges 4 and 5 as is illustrated in the figures and whereby the centre distance between said slotted holes is 65 mm.

Fig 5 shows a development of a plate-shaped portion, which can be used for making air ducts with smaller diameters e.g. between ± 630 mm and 1025 mm. As is illustrated in this figure the centre distance between the slotted holes, which for the rest have the same length as in the first mentioned embodiment, has thereby been chosen smaller and is preferably 90 mm here. The centre distance between the slotted holes arranged closely together near the boundary lines 4 and 5 has thereby been kept equal to that of the embodiment discussed first.

The width of the strip of the sheet joining a boundary edge 4 or 5 measured in the direction of the corrugations is preferably

less than 1/20 of the width of the developed sheet illustrated in figs 3 and 5 measured between the boundary edges 4 and 5.

CLAIMS

1. Air duct formed by a plate-shaped element provided with passages, having a curved course in cross-section and a corrugated course in longitudinal section, characterised in that rectangular slotted holes have been provided only in the tops of the corrugations in those portions of the plate-shaped element which join the boundary edges of said plate-shaped element that rest on the floor.

2. Air duct as claimed in claim 1, characterised in that, seen in the longitudinal direction of the air duct, slotted holes in successive corrugation tops are staggered relatively to each other.

3. Air duct as claimed in claim 1 or 2, characterised in that, seen in the longitudinal direction of the air duct, the slotted holes provided in the corrugation tops and located nearest the boundary edges, lie in a line.

4. Air duct as claimed in any of the preceding claims, characterised in that the slotted holes have been provided in such a manner that the longitudinal axes of the slotted holes coincide with the longitudinal axes of the corrugation tops.

5. Air duct as claimed in any of the preceding claims, characterised in that the length of a slotted hole is ± 50 mm and the width is ± 20 mm.

6. Air duct as claimed in any of the preceding claims, characterised in that the width of the strip, joining the boundary edge of an air duct, in which the slotted holes have been provided, measured in the longitudinal direction of a corrugation top, is not more than 1/20 of the entire length of said corrugation top.

0183308

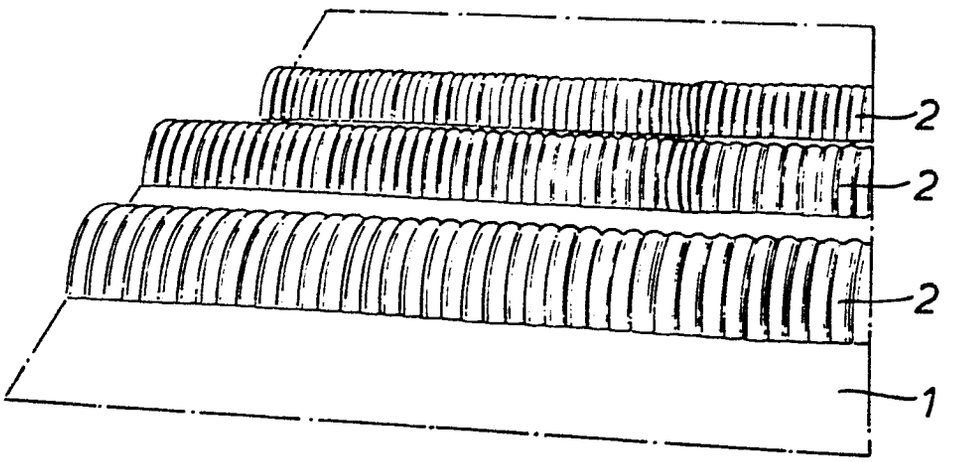

FIG.1.

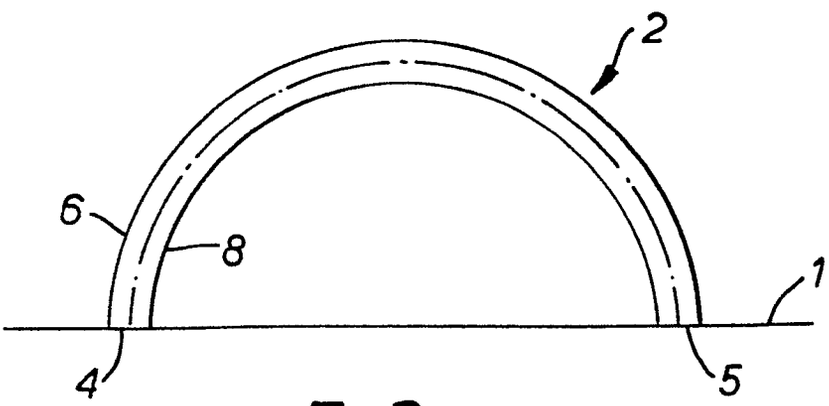

FIG.2.

0183308

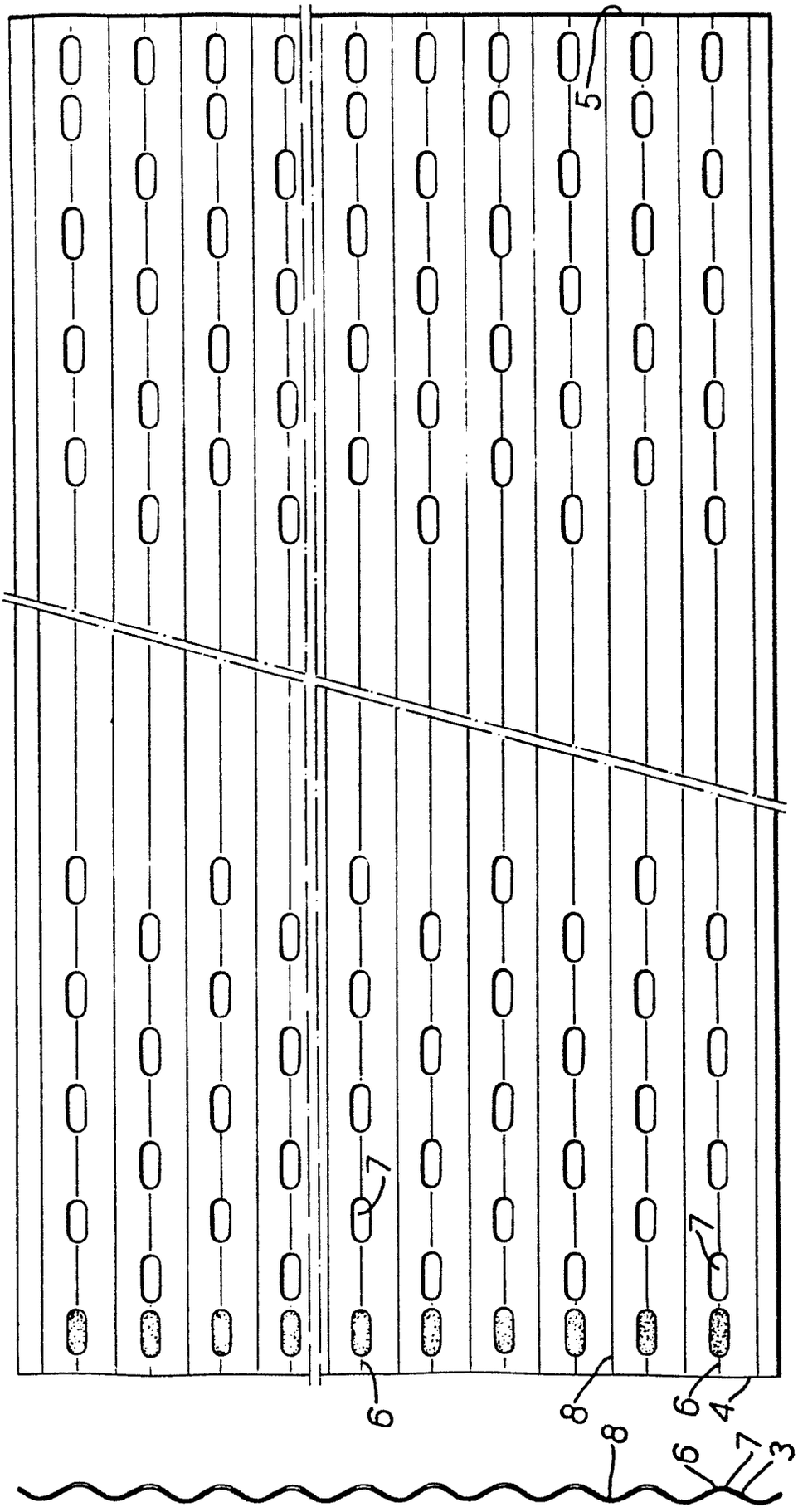

FIG.3.

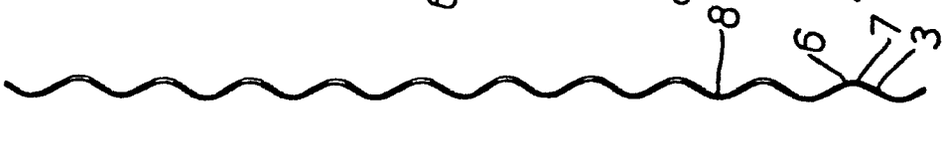

FIG.4.

0183308

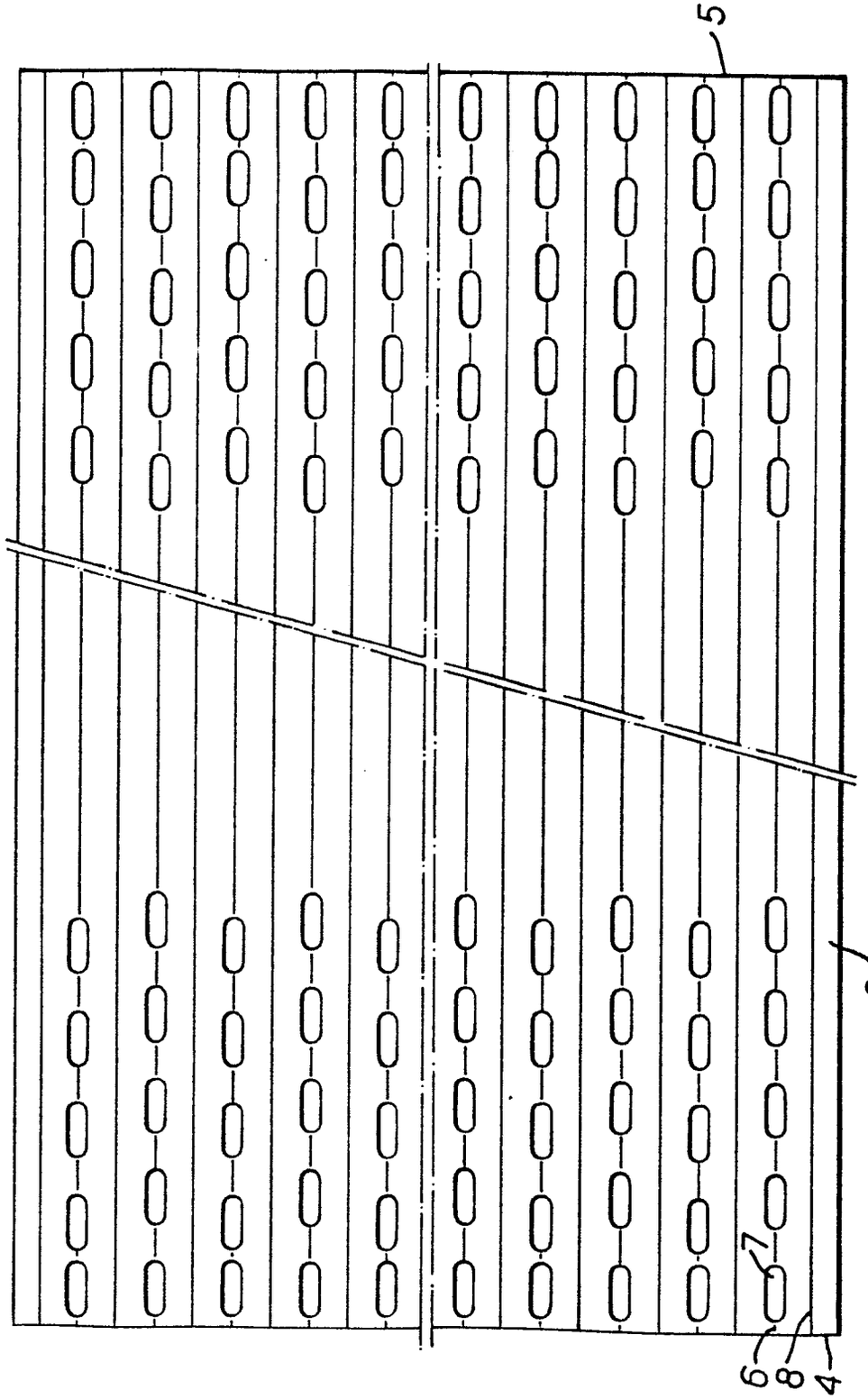

FIG.5.

European Patent Office

EUROPEAN SEARCH REPORT

0183308
Application number

EP 85 20 1856

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int Cl 4)
A	US-A-3 054 342 (McVICAR)		F 26 B 25/10 F 26 B 9/06 F 26 B 21/00
A	US-A-2 196 391 (GRONERT)		
A	US-A-3 136 240 (RABE)		
A	US-A-2 818 009 (STEFFEN)		

TECHNICAL FIELDS SEARCHED (Int Cl.4)

F 26 B
B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17-02-1986	DE RIJCK F.

CATEGORY OF CITED DOCUMENTS

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

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

EPO Form 1503 03.82