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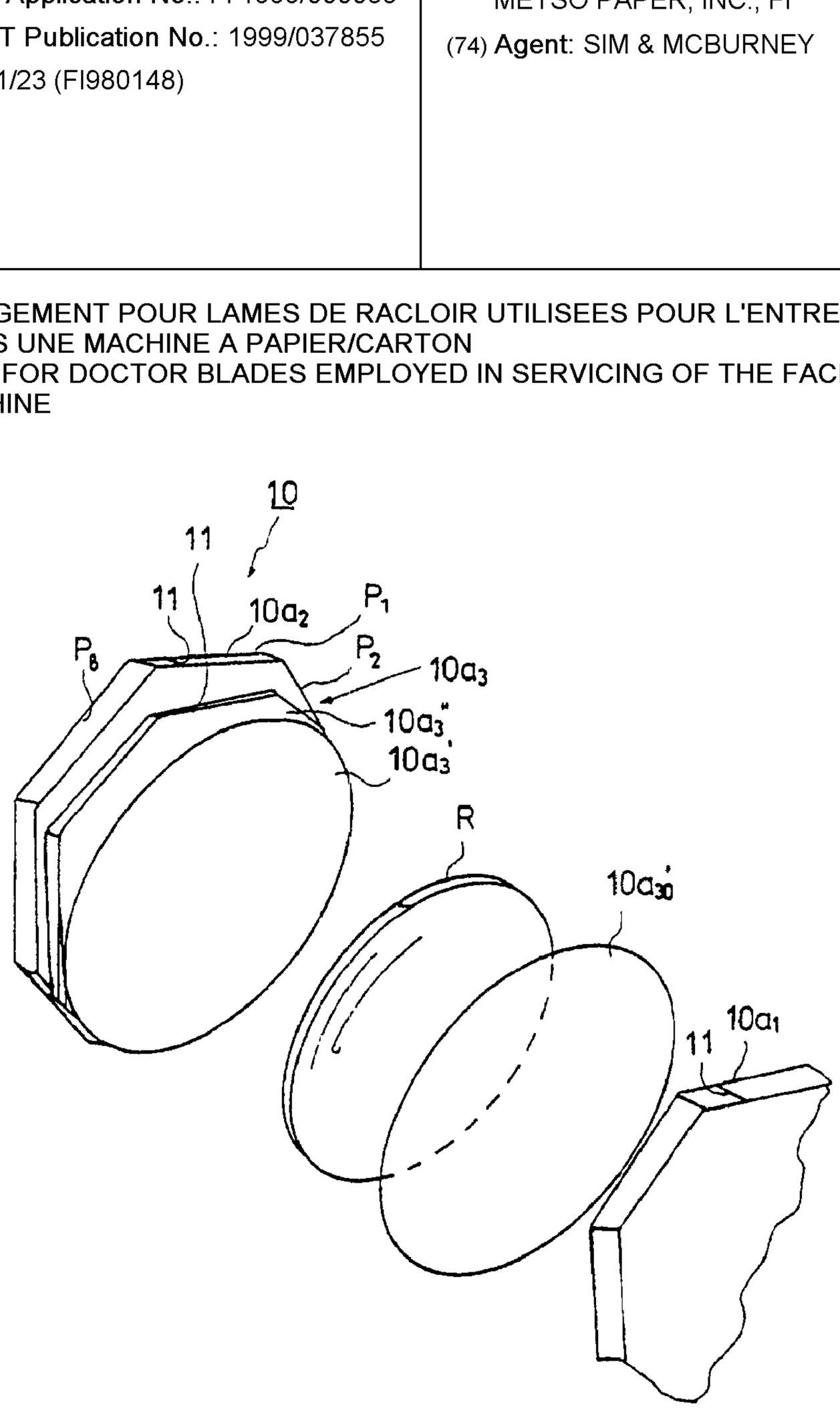
(54) Titre : BOITE DE RANGEMENT POUR LAMES DE RACLOIR UTILISEES POUR L'ENTRETIEN DE LA SURFACE D'UN ROULEAU DANS UNE MACHINE A PAPIER/CARTON

(54) Title: STORAGE BOX FOR DOCTOR BLADES EMPLOYED IN SERVICING OF THE FACE OF A ROLL IN A PAPER/BOARD MACHINE



(57) Abrégé/Abstract:
The invention concerns a storage box (10) for doctor blades employed in servicing of the face of a roll in a paper/board machine. The box is a polygon construction, in whose interior the reel (R) formed by doctor blades (t_1, t_2) has been fitted. Through an

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(57) Abrégé(suite)/Abstract(continued):
opening (11) in a side face of the storage box, the doctor blades (t_1, t_2, ...) can be discharged from the reel (R) placed inside the storage box (10). In its interior, the storage box (10) comprises bearing means, preferably at least one separate disk ($10a_3$'), which has been fitted to revolve freely on the side face of the reel (R) formed by the doctor blades.

CORRECTED VERSION*

REVISED VERSION**

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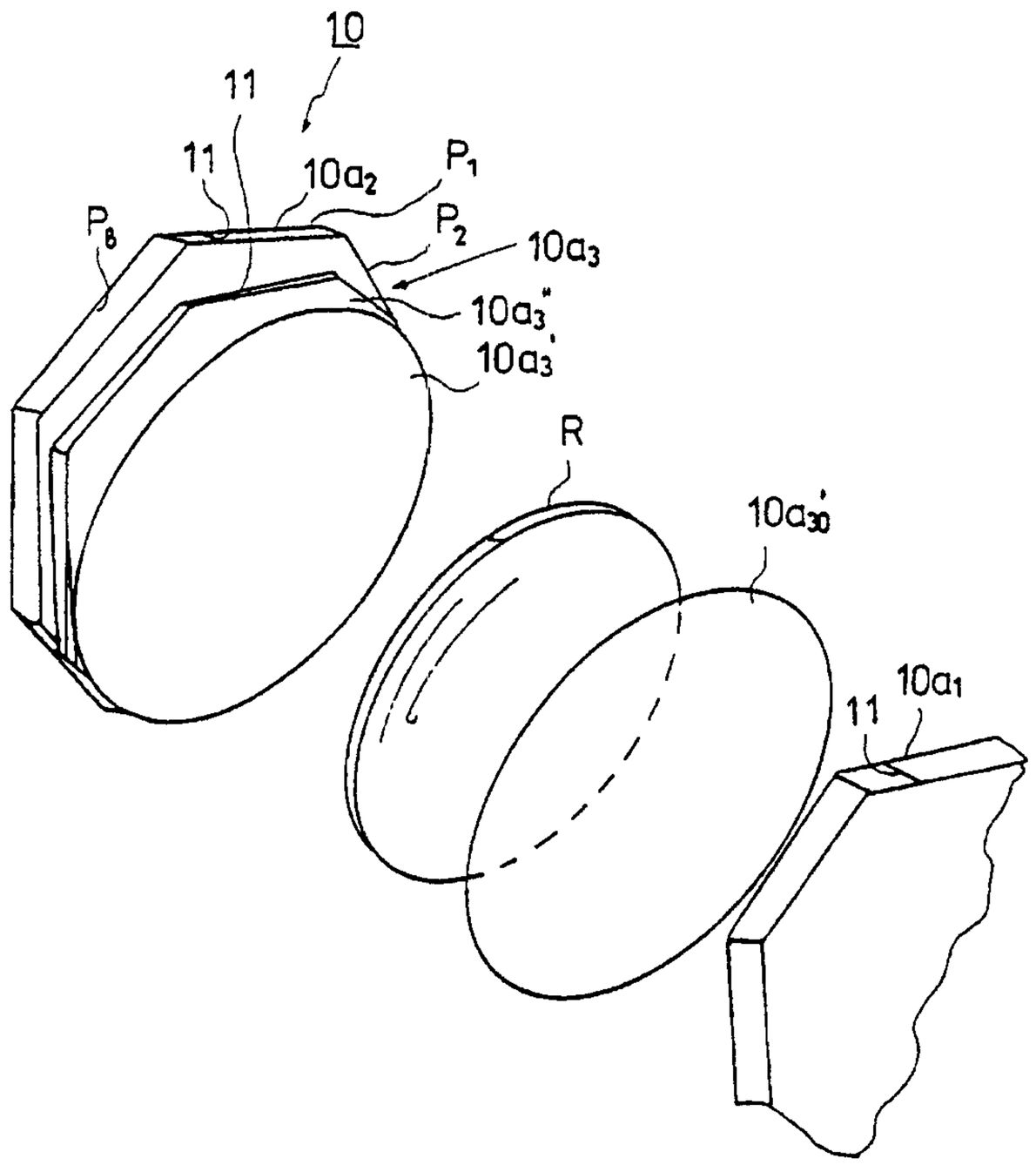
(54) Title: STORAGE BOX FOR DOCTOR BLADES EMPLOYED IN SERVICING OF THE FACE OF A ROLL IN A PAPER/BOARD MACHINE

(57) Abstract

The invention concerns a storage box (10) for doctor blades employed in servicing of the face of a roll in a paper/board machine. The box is a polygon construction, in whose interior the reel (R) formed by doctor blades (t_1, t_2) has been fitted. Through an opening (11) in a side face of the storage box, the doctor blades (t_1, t_2, ...) can be discharged from the reel (R) placed inside the storage box (10). In its interior, the storage box (10) comprises bearing means, preferably at least one separate disk ($10a_3$'), which has been fitted to revolve freely on the side face of the reel (R) formed by the doctor blades.



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Storage box for doctor blades employed in servicing of the face of a roll in a paper/board machine

The invention concerns a storage box for doctor blades employed in servicing of the face of a roll in a paper/board machine.

In prior-art solutions, the doctor blades have been stored in paper mills as straight blades in storage shelves for doctor blades. In such a case, there is a risk that a blade that is constantly exposed is damaged. Even a small dent in the blade face makes the blade unusable.

In the present patent application, an entirely novel solution for storage of blades is suggested. In the present patent application, it is suggested that a storage box be used for doctor blades. The doctor blades have been joined together from their ends, and the blades have been wound onto a reel. Said reel of doctor blades has been inserted into a storage box, and the doctor blades can be taken/pulled out of said storage box by unwinding the reel of doctor blades.

In accordance with the present invention, the storage box consists of two parts: a cover part and a bottom part. The cover part is fitted so that the edges of the cover are placed around the edges of the bottom part. The box is favourably of octagonal shape. According to the invention, separate bearing means which promote the rotation of the reel of doctor blades have been fitted inside the cover part and the bottom part of the box. Since the storage box is favourably made of cardboard, the bearing part has preferably also been made of cardboard. The bearing means preferably comprise two circular disks, against which the side faces of the reel of doctor blades are placed. One of the circular disks has been fitted freely against one side face of the reel of doctor blades, and the other disk against the other side face. Further, one of the circular disks has been fitted to be placed against a backup

bearing part, which is also made of cardboard. Favourably, both faces of both of the circular disks have been treated with a coating which reduces the friction. The coated bearing face of the circular disk is placed against a preferably likewise coated backup bearing face. One preferably silicon-coated backup bearing face for the circular disk is the plane face of a backup bearing part and a second preferably silicon-coated backup bearing face for the other circular disk is the inside plane face of the bottom part.

The backup bearing part has been formed out of an octagonal plate so that the fold parts of the plate have been bent into an angle of 90° against the bottom face of the middle area of the plate. Said folded edges form a bearing face at the outer circumference of the reel of doctor blades. Thus, the friction between the side face of the reel of doctor blades and the outer circumference is reduced. The other circular disk has been fitted between the other side face of the reel of doctor blades and the inner face of the bottom.

Thus, the storage box is provided with inside bearing means, which permit easy rotation of the reel of doctor blades and easy discharge of the reel, i.e. easy pulling of blades out of the interior of the box. The box operates all the time as a storage box until the last doctor blade has been pulled out of the interior of the box.

In accordance with one aspect of the present invention, there is provided a storage box for doctor blades employed in servicing of the face of a roll in a paper/board machine, which box is a polygon construction and in whose interior the reel formed by doctor blades has been fitted, and from which box, through an opening in a side face of the box, the doctor blades can be

discharged from the reel placed inside the storage box, wherein, in its interior, the storage box comprises bearing means, preferably a separate disk, which has been fitted to revolve freely on the side face of the reel formed by the doctor blades.

The invention will be described in the following with reference to some preferred embodiments of the invention illustrated in the figures in the accompanying drawings, the invention being, yet, not supposed to be confined to said embodiments alone.

Figure 1A shows a storage box 10 in accordance with the invention for doctor blades as assembled. In its interior the storage box 10 includes a reel R composed of doctor

blades t_1, t_2 ..., which can be discharged through an opening provided in the side face of the storage box.

Figure 1B illustrates a reel R of doctor blades consisting of doctor blades t_1, t_2.

Figure 1C is an exploded view of a storage box for doctor blades.

Figure 2A shows the bottom/cover part of the storage box as spread out.

Figure 2B illustrates folding of the edges of the bottom/cover part along the creases so that the edge parts are formed perpendicularly to the middle area while the edge parts are locked in slots placed at the edges of the middle area.

Figure 2C shows the second stage of folding, i.e. interlocking of adjacent edge parts with each other.

Figure 3A illustrates formation of the bearing part out of two jointly operative structural components. The illustration in the figure is an axonometric view in part.

Figure 3B is a spread-out illustration of a backup bearing part.

Figure 3C illustrates folding of the edges of the backup bearing part perpendicularly to the middle area in order to form the edge portion of the bearing arrangement.

Figure 3D shows a bearing part, favourably a circular disk.

Fig. 1A is an axonometric view of a storage box 10 in accordance with the invention. The storage box 10 is favourably octagonal, and the material is corrugated board, cardboard, relatively stiff plastic, or equivalent. As is shown in the figure, the reel R of doctor blades can be discharged out of the storage box 10 through the discharge opening 11.

Fig. 1B is an illustration of principle of formation of a reel R of doctor blades so that the doctor blades t_1,t_2... are joined together by means of a binding strap from their ends while the blade ends overlap each other.

Fig. 1C shows the storage box 10 as disassembled into its parts $10a_1$,$10a_2$ and $10a_3$. The storage box 10 comprises a bottom part $10a_1$, a cover part $10a_2$, and bearing means $10a_3$ placed in the interior of the box, which bearing means consist of a first bearing disk $10a_3$', preferably a circular disk, and of a backup bearing part $10a_3$", and of a second bearing disk $10a_{30}$', preferably a circular disk. The disk faces of both circular disks $10a_3$',$10a_{30}$' have been coated with a material that reduces friction, favourably silicon. Similarly, the face planes of the backup bearing part $10a_3$" and of the bottom part $10a_1$, against which the circular disks $10a_3$',$10a_{30}$' will be placed, have been coated with a material that reduces friction, favourably silicon. As is shown in the figure, the storage box 10 is favourably octagonal, and so it can be placed readily on support of one of its side faces, in which case the doctor blades can be discharged from the reel R of doctor blades placed in the interior of the box through the through opening 11 provided in the side face of the storage box. The through openings 11 are placed in the same locations one above the other in the parts $10a_2$, $10a_1$ and $10a_3$", so that the doctor blades t_1,t_2... can be discharged from the reel R through the openings 11 provided in the parts $10a_2$, $10a_1$ and $10a_3$" of the storage box 10.

Fig. 2A is a spread-out illustration of the bottom part $10a_1$ and the cover part $10a_2$ of the storage box. The bottom part $10a_1$ and the cover part $10a_2$ comprise eight edge parts, i.e. the edge parts P_1,P_2,P_3,P_4,P_5,P_6,P_7, and P_8. The edge parts are provided with creases D_1,D_2,D_3 ... D_8. The fold lines of the creases D_1,D_2,D_3 ... D_8;D_2',D_4' ... D_8' form an octagon when the spread-out illustration of the part is viewed from above. At the edges of the bottom area e of the box, in connection with every second edge part P_2,P_4,P_6..., there are corresponding slots f_1,f_2, and the fold edge P_2' connected with the edge part P_2 related to said slots f_1,f_2... can be folded so that the locking tongues c_1,c_2 ... connected with said fold edge are inserted in the slots f_1,f_2.

When the box is assembled, the edge parts P_1,P_2 ... P_8 are raised so that they are perpendicular to the face plane of the bottom area e. Every second edge part P_1,P_3 is folded so that, for example, the ends P_{1a},P_{3a} ..., which are inclined in relation to the directions or lines of the creases D_1,D_3, are placed between the edge parts P_2,P_2';P_4,P_4' ... of the adjacent edge sectors. The edge tongues c_1,c_2 of the fold edge P_2' are locked in the corresponding slots f_1,f_2 in the middle part e. The inclined end P_{1A} of the edge part P_1 is locked between the edge parts P_2,P_2'.

Fig. 2B illustrates the formation of the bottom part $10a_1$, and so also of the cover part $10a_2$, of the storage box 10 for doctor blades so that the edge parts P_1,P_2, P_2' are folded in the way described above so that the edge tongues c_1,c_2 of the edge parts P_2' are fitted into the corresponding slots f_1,f_2 in the bottom area e. The construction of the cover part $10a_2$ is equal to the construction of the bottom part $10a_1$. The cover part $10a_2$ has larger measures than the part $10a_1$, and so the cover part $10a_2$ is fitted around the bottom part $10a_1$.

Fig. 2C illustrates the part $10a_1$,$10a_2$ as folded together, i.e. the ultimate stage of folding following after the stage shown in Fig. 2B.

Fig. 3A illustrates formation of the bearing part $10a_3$. The bearing part $10a_3$ comprises a bearing part $10a_3$', which is placed against the backup bearing part $10a_3$". The part $10a_3$' is a circular disk, whose outer face is provided with a coating, preferably a silicon coating, which reduces the friction. The outer face of the circular disk $10a_3$' enters into contact with the backup bearing face N of the backup bearing part $10a_3$". Said face N has also been treated favourably with a material that reduces friction, preferably provided with a coating, preferably a silicon coating.

Fig. 3B is a spread-out illustration of the part $10a_3$". The part $10a_3$" is likewise made of an octagonal construction, and it comprises eight edge parts M_1,M_2,M_3 ... M_8. The edge parts M_1 ... M_8 are placed at the outer edge of the middle area e_2 of the plate part $10a_3$", and they are provided with creases or crease lines n_1,n_2 ... n_8. The edge part M_1,M_2 ... is provided with end edges i, which are placed perpen-

dicularly to the creases n_1,n_2..., and with second end edges i', which are placed as inclined in relation to said crease lines n_1,n_2 ....

As is shown in Fig. 3C, the edge parts M_1,M_2 ... of the part $10a_3$" are folded so that they are perpendicular to the plane of the middle area e_2, in which case, for example, the inclined end edge i' of the edge part M_1 is placed underneath the end edge i of the adjacent edge part M_8.

Fig. 3D shows the bearing disk $10a_3$' or $10a_{30}$' as a separate illustration.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A storage box for doctor blades employed in servicing of a face of a roll in a paper or a board machine, which box is a polygon construction and in whose interior a reel formed by doctor blades has been fitted, and from which box, through an opening in a side face of the box, the doctor blades can be discharged from the reel placed inside the storage box, wherein, in its interior, the storage box comprises bearing means, which has been fitted to revolve freely on a side face of the reel formed by the doctor blades.

2. A storage box as claimed in claim 1, wherein the bearing means is a circular disk.

3. A storage box as claimed in claim 2, wherein the bearing means has been fitted to be placed against a face of a backup bearing part, which backup bearing part comprises edge parts, in which connection the reel formed by doctor blades has been fitted in the area between the edge parts and a middle area of a plate part, and the bearing means has been fitted between the reel, formed by doctor blades and the middle area of the plate part, in which case inner faces of the edge parts form a bearing face for the circumferential face of the reel of doctor blades.

4. A storage box as claimed in claim 3, wherein edge parts of the backup bearing part have been folded perpendicularly to the middle area of the plate part, and they are placed so that their end edges overlap each other.

5. A storage box for doctor blades as claimed in any one of the claims 1 to 4, wherein there are two circular disk parts, and said disk parts have been meant to be fitted at both sides of the reel of doctor blades formed by the doctor blades.

6. A storage box as claimed in any one of claims 1 to 5, wherein the bearing means is provided with a coating.

7. A storage box as claimed in any one of claims 1 to 6, wherein the backup bearing part is provided with a coating.

8 A storage box as claimed in claim 6 or 7, wherein the coating is a silicon coating.

9. A storage box as claimed in any one of claims 1 to 8, wherein the material of the storage box and of the bearing means related to said box is corrugated board, cardboard or relatively stiff plastic.

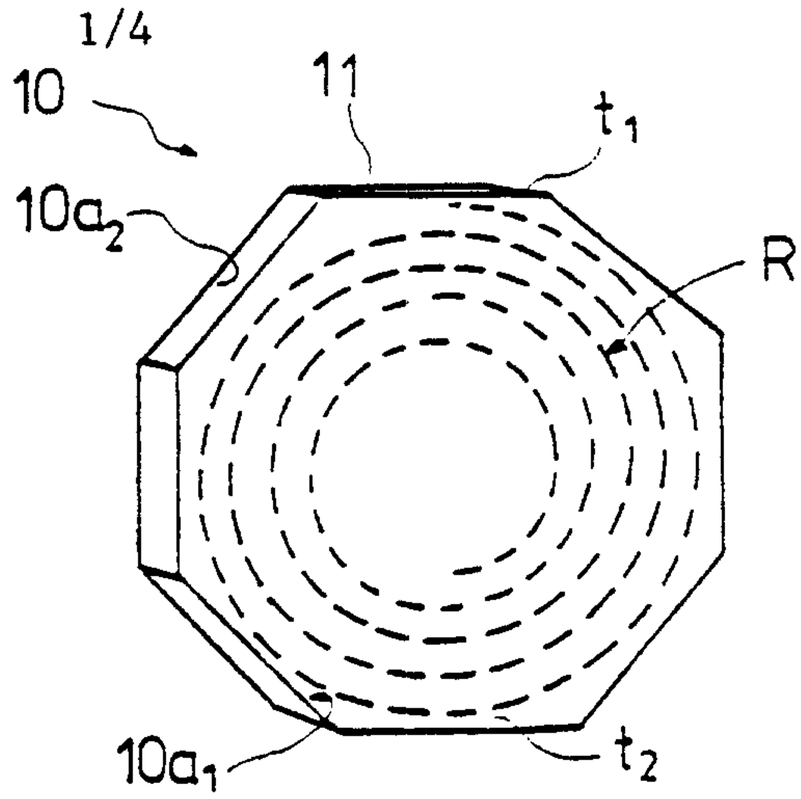


FIG. 1A

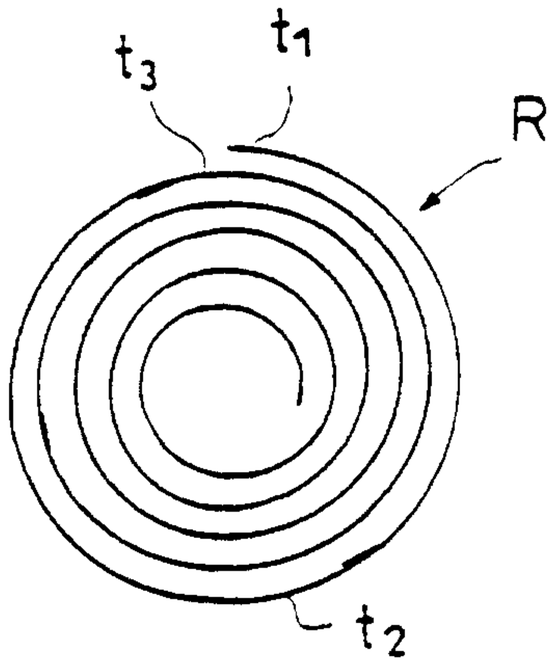


FIG. 1B

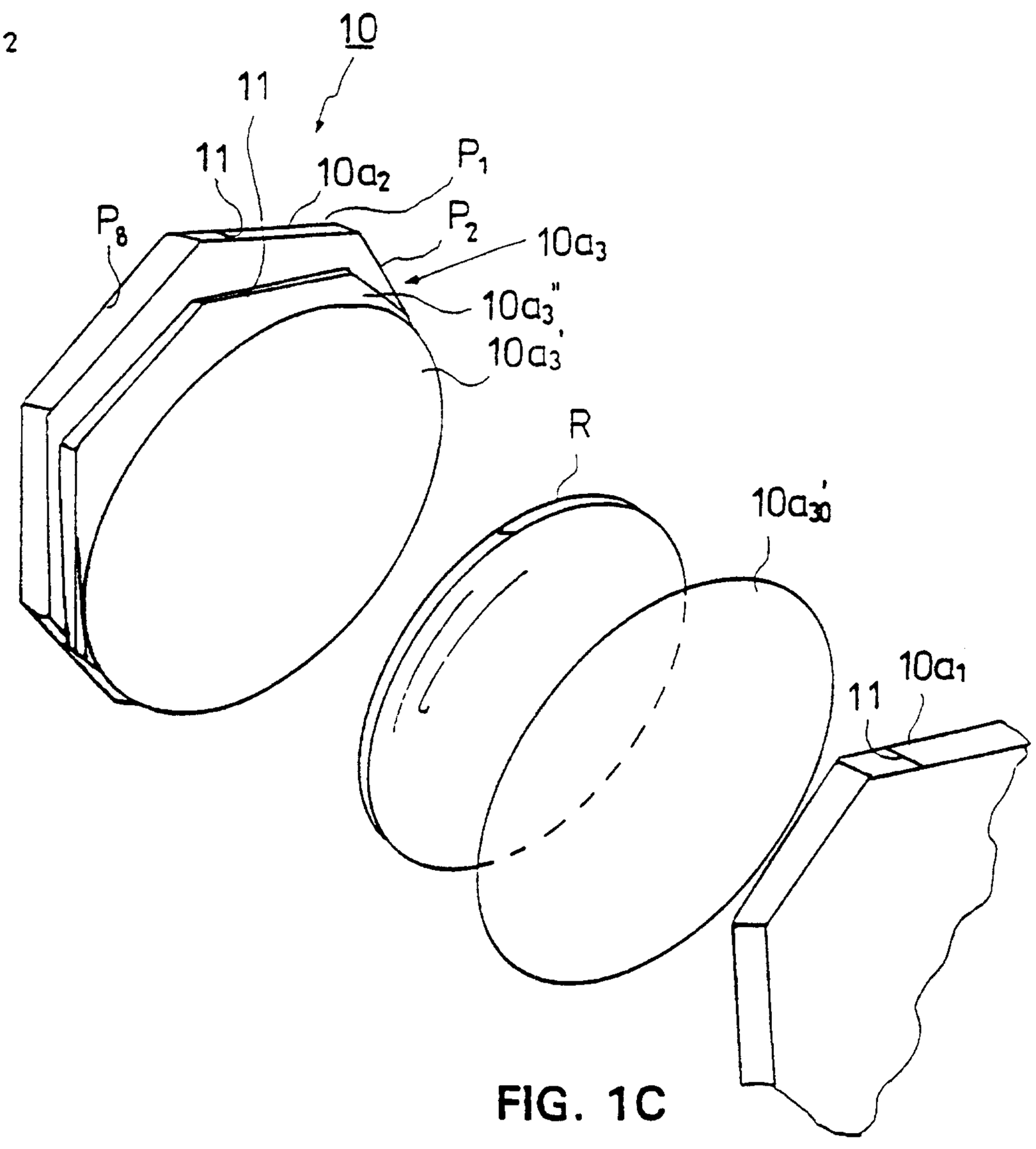


FIG. 1C

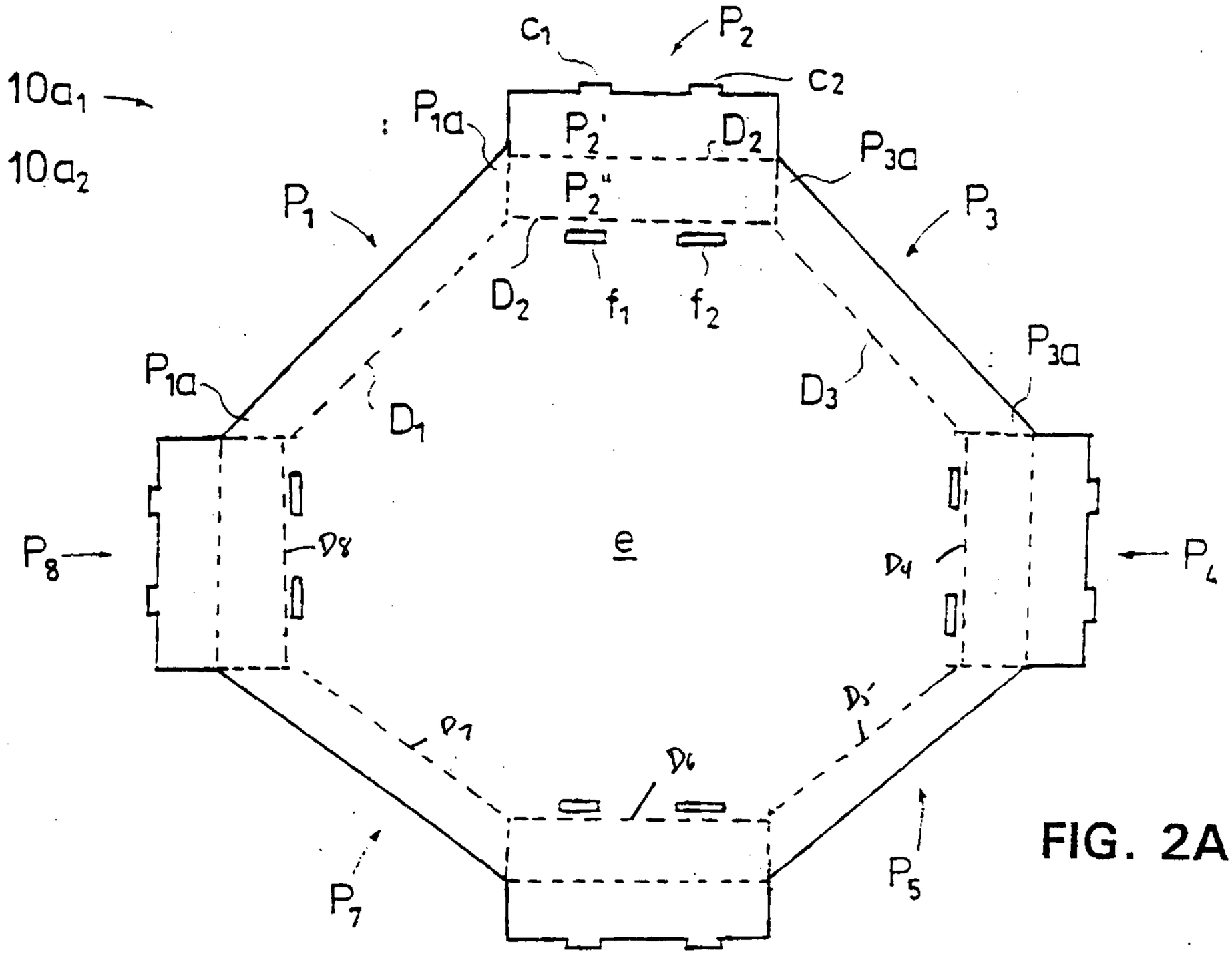


FIG. 2A

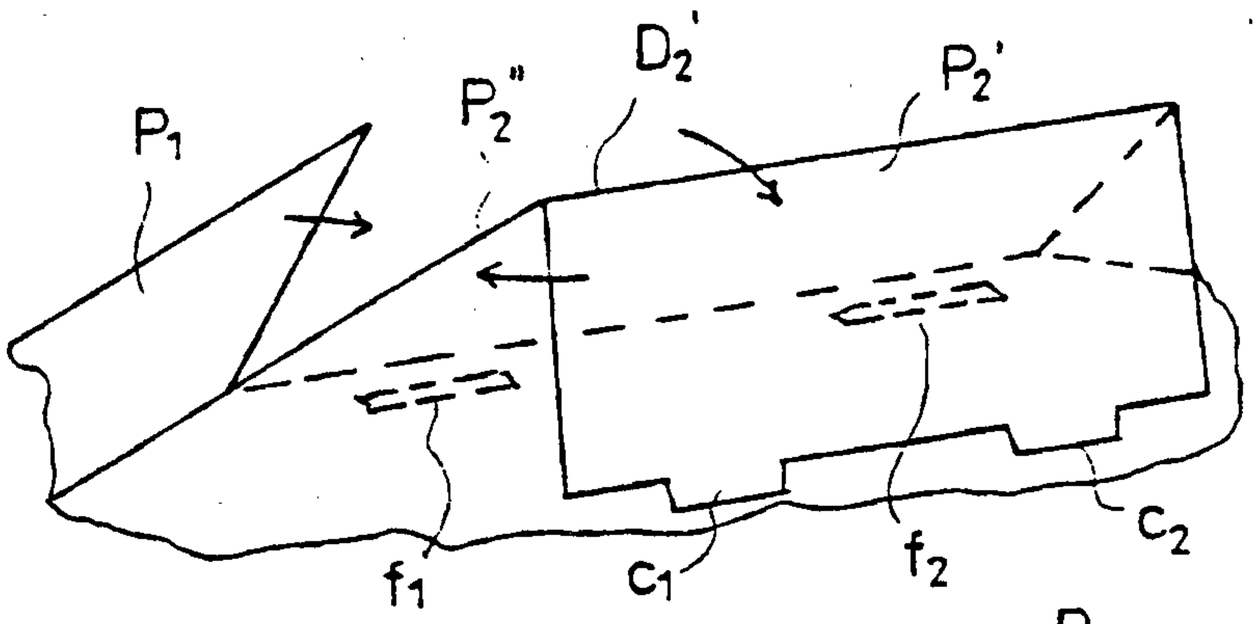


FIG. 2B

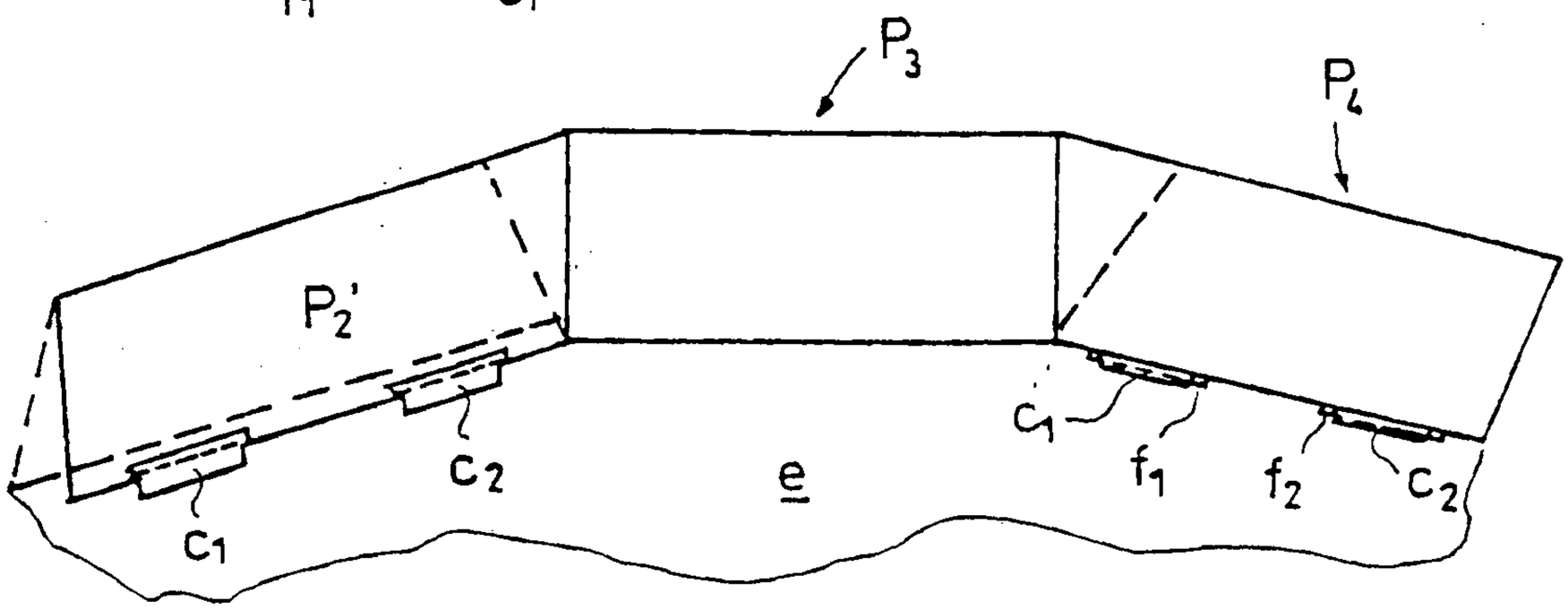


FIG. 2C

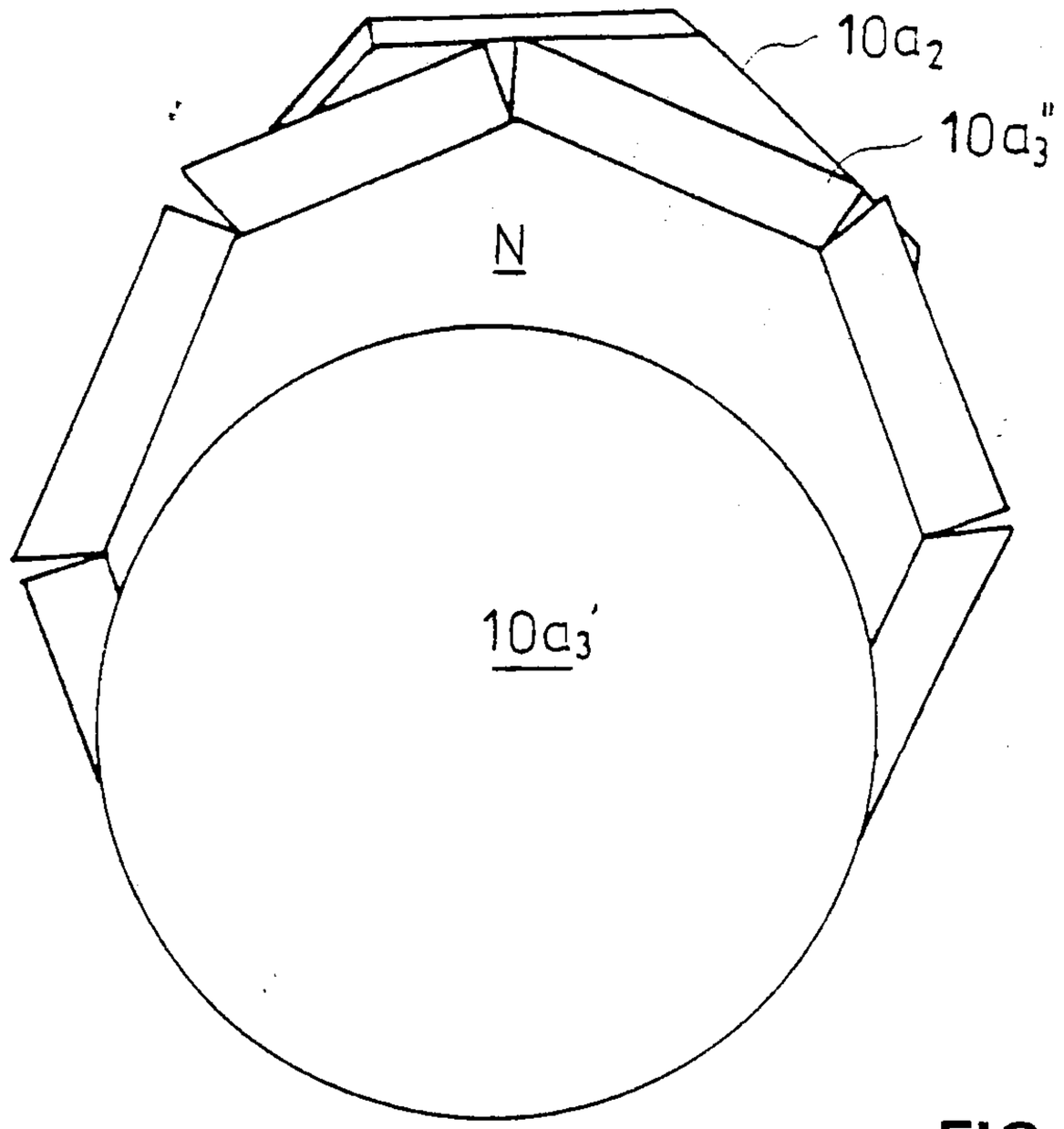

10a2
10a3"
N
10a3'

FIG. 3A

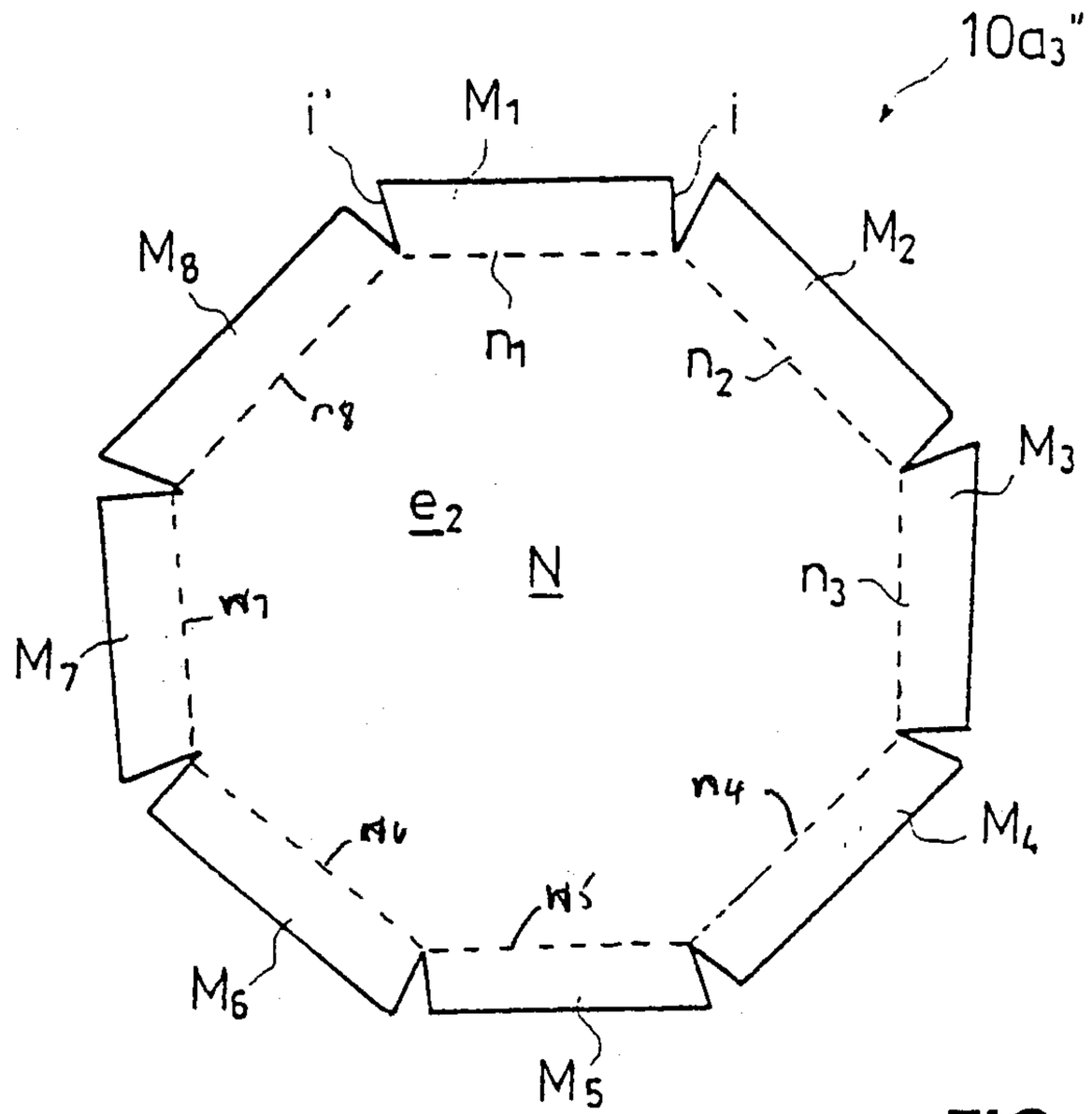

10a3"
i'
M1
i
M8
M2
n1
n2
r8
M3
e2
N
r1
n3
M7
n4
M4
r6
r5
M6
M5

FIG. 3B

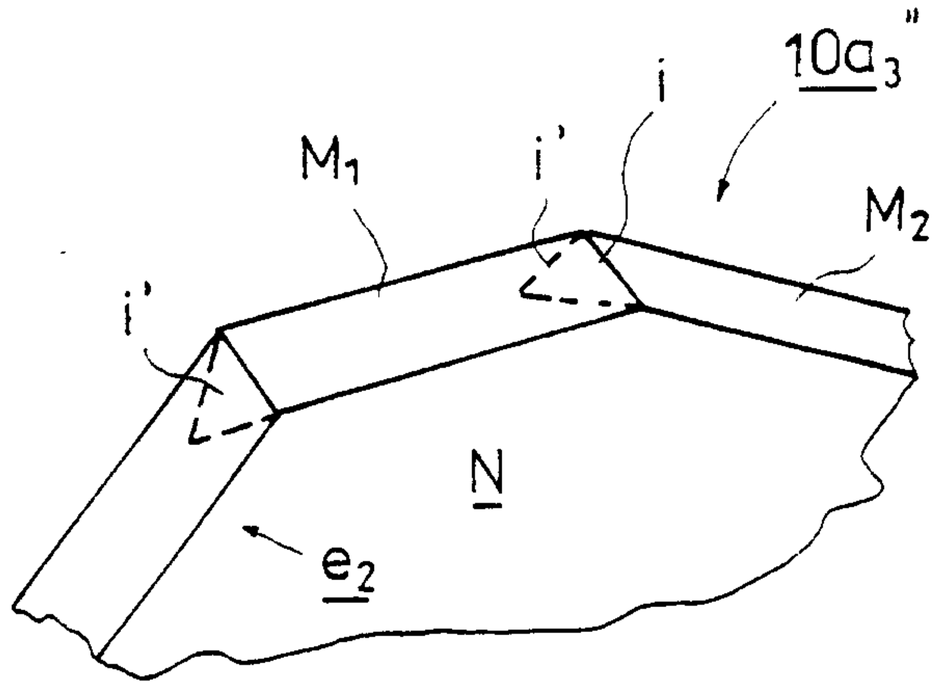


FIG. 3C

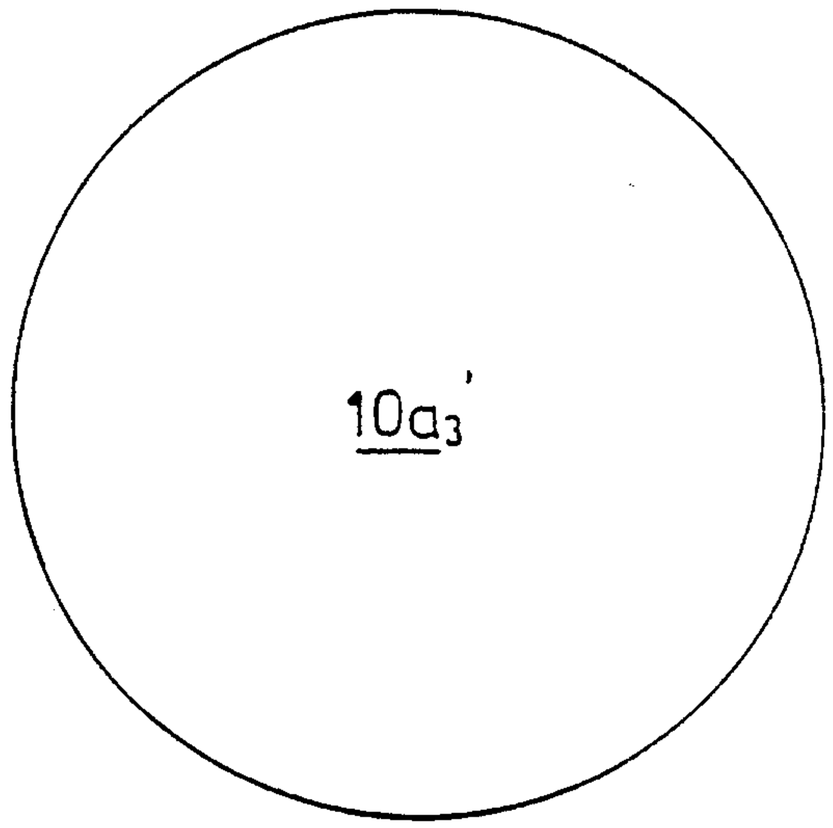
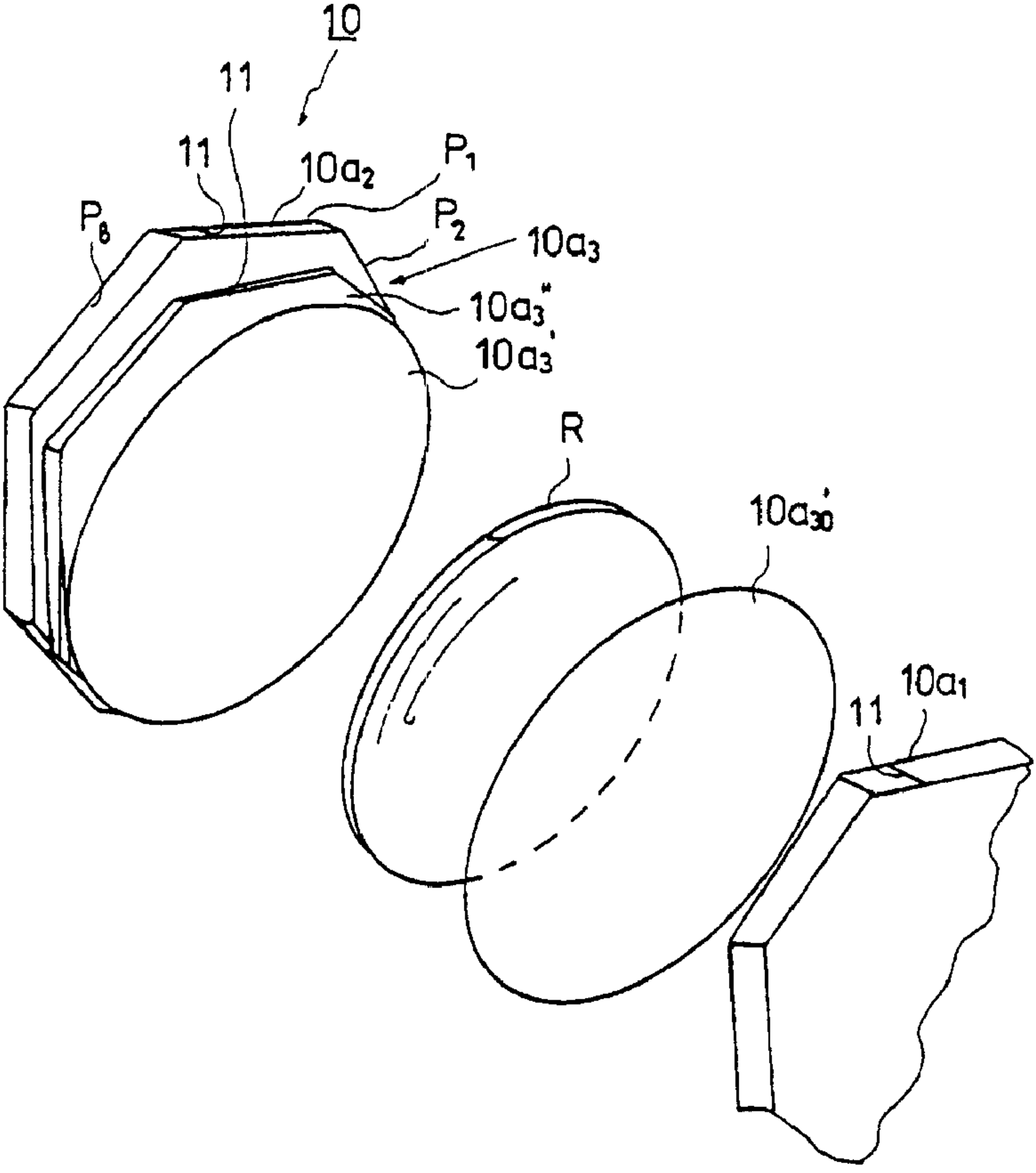


FIG. 3D


10
11
11
10a2
P1
P2
P8
10a3
10a3"
10a3'
R
10a30
10a1
11