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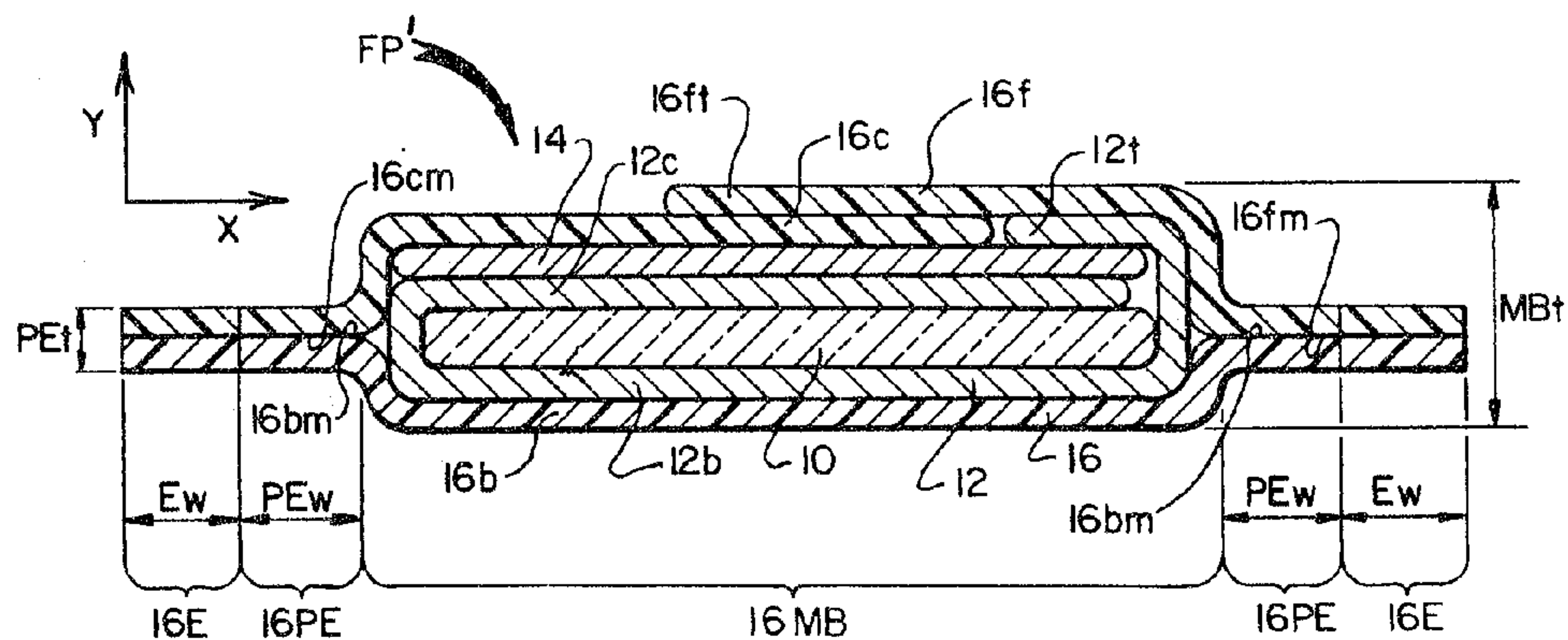
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(54) **POCHETTE DE FILM POUR RADIOGRAPHIES DENTAIRES**

(54) **DENTAL FILM PACKET IMPROVEMENT**



(57) A comfort-enhancing improvement upon a known dental film packet (FP) having sensitized film and protective opaque sheets (10 and 12, 14) enclosed by a light-tight envelope (16) that includes an opposed pair of generally parallel walls (16b and 16c, 16f) covering the sheets (10 and 12, 14), those walls (16b and 16c, 16f) being joined together along facing marginal areas thereof (16bm and 16cm, 16fm) surrounding the sheets (10 and 12, 14) so as to define a main body portion (16MB) and a perimetric edge portion (16PE) of the envelope (16). The improvement is characterized by a deflectable lateral extension (16E) of at least part of the perimetric edge portion (16PE), the extension (16E) projecting outwardly therefrom by an amount rendering that part of the edge portion (16PE) and its extension (16E) sufficiently flexible to be readily deflected and folded back around part of the main body portion (16MB) toward one of said walls (16b and 16c, 16f), thereby forming a curved resilient cushion where so folded (C), when the improved packet (FP') is intraorally positioned for a radiographic exposure. In the embodiment illustrated, the extension (16E) projects continuously from all of, and is formed as an integral continuation of, the perimetric edge portion (16PE), and thus surrounds the main body portion (16MB) with a pliant cushioning flap (FF).

DENTAL FILM PACKET IMPROVEMENT
ABSTRACT OF THE DISCLOSURE

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A comfort-enhancing improvement upon a known dental film packet (FP) having sensitized film and protective opaque sheets (10 and 12, 14) enclosed by a light-tight envelope (16) that includes an opposed
10 pair of generally parallel walls (16b and 16c, 16f) covering the sheets (10 and 12, 14), those walls (16b and 16c, 16f) being joined together along facing marginal areas thereof (16bm and 16cm, 16fm) surrounding the sheets (10 and 12, 14) so as to define
15 a main body portion (16MB) and a perimetric edge portion (16PE) of the envelope (16). The improvement is characterized by a deflectable lateral extension (16E) of at least part of the perimetric edge portion (16PE), the extension (16E) projecting outwardly
20 therefrom by an amount rendering that part of the edge portion (16PE) and its extension (16E) sufficiently flexible to be readily deflected and folded back around part of the main body portion (16MB) toward one of said walls (16b and 16c, 16f), thereby forming a
25 curved resilient cushion where so folded (C), when the improved packet (FP') is intraorally positioned for a radiographic exposure. In the embodiment illustrated, the extension (16E) projects continuously from all of, and is formed as an integral continuation of, the
30 perimetric edge portion (16PE), and thus surrounds the main body portion (16MB) with a pliant cushioning flap (FF).

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DENTAL FILM PACKET IMPROVEMENT

BACKGROUND OF THE INVENTION

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Field of the Invention

The present invention relates generally to intraoral dental radiographic film packets, and particularly to an improvement therein that renders them more comfortable for the patient.

Description of the Prior Art

15 The prior art is replete with dental film packets of the type referred to above. Examples may be found in the following documents:

20 U.S. Patent No. 1,631,497 - Discloses a dental x-ray film package comprising superposed sensitized and protective sheets and a soft, pliable beading that embraces their edges to hold the sheets together and to render the package more comfortable in use; the beading may be of molded rubber or a stretched rubber band cemented in place.

30 U.S. Patent No. 3,443,093 - Discloses a dental x-ray film package comprising sensitized and protective sheets superposed within a readily openable sealed envelope of substantially uniform overall thickness.

35 U.S. Patent No. 4,626,216 - Discloses a resilient pad (made of foamed ethylene vinyl acetate) that is folded over, and adhered to, one edge and two corners of a dental x-ray film packet, to enhance comfort and to facilitate positioning in the patient's mouth.

While such film packages and associated pads may have sufficed for their respective purposes, there has remained a persistent need for a dental film packet
5 improvement that would efficiently render the packet more comfortable when operatively positioned inside a patient's mouth. This need has long existed, especially for the particular type of film packet disclosed in the cited U.S. Patent No. 3,443,093. The
10 squared-off edge defining the perimeter of that packet has been a continuing cause of discomfort for some patients whenever that edge has been pressed into sensitive tissues of the mouth.

15 A common approach to cushioning that edge has been to attach a soft pad around it, as disclosed, for example, in the cited U.S. Patent No. 4,626,216. One drawback to adding a cushioning pad has been the resulting increase in overall film package size, which
20 may make it difficult to position the package correctly in the patient's mouth, and may cause stacking and gating problems when loaded into commonly used film packet dispensing devices. Another drawback of the typical cushioning pad has been that the open-cell, or
25 foamed, material used therein to enhance its cushioning effect absorbs patient saliva, which may be contaminated with contagious viruses.

Although dental x-ray film packets of the type
30 disclosed in U.S. Patent No. 3,443,093 have been widely used for more than twenty years, the long-recognized need to ameliorate discomfort felt by some patients, in a practical and efficient manner, without adversely increasing the packet's in-use size, and without
35 employing highly porous, saliva-absorbing materials, remains unresolved.

SUMMARY OF THE INVENTION

5 A primary object of this invention has been to meet the foregoing need for such a comfort-enhancing film packet improvement. Another object has been to do so in a totally reliable, yet practical and economical, manner. Those and other objects have been achieved by the invention herein disclosed and claimed.

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This invention finds utility as a comfort-enhancing improvement upon a known intraoral dental radiographic film packet having sensitized film and protective opaque sheets enclosed by a light-tight envelope that includes an opposed pair of generally parallel walls covering the sheets, those walls being joined together along facing marginal areas thereof surrounding the sheets so as to define a main body portion and a perimetric edge portion of the envelope. The improvement comprises a deflectable lateral extension of at least part of the perimetric edge portion, said extension projecting outwardly therefrom by an amount rendering that edge portion part and its extension sufficiently flexible to be readily deflected when the packet is operatively positioned inside a patient's mouth, thereby cushioning the impact of the envelope perimetric edge. In the preferred embodiment of this invention, the extension projects outwardly from, and continuously along, all of the perimetric edge portion.

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This invention, and its objects and advantages, will become more apparent in the detailed description of the preferred embodiment presented hereinbelow.

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BRIEF DESCRIPTION OF THE DRAWINGS

In the detailed description of the preferred
5 embodiment of this invention presented below, reference
is made to the accompanying drawings, wherein like
reference characters denote like elements, and wherein:

Fig. 1 is a top-plan view of an intraoral dental
10 radiographic film packet as known in the prior art, and
to which the film packet improvement of this invention
is directed;

Fig. 2 is a cross-sectional elevation of the known
15 packet depicted in Fig. 1, taken along line 2-2 therein
and showing principal components thereof exaggerated in
thickness for clarity of illustration;

Fig. 3 is a top-plan view similar to Fig. 1 but
20 illustrating the film packet therein as improved by the
preferred embodiment of this invention, and as disposed
in its normally flat condition;

Fig. 4 is a cross-sectional elevation of the
25 improved packet of Fig. 3, taken along line 4-4 therein
and showing its principal components exaggerated in
thickness for clarity; and

Fig. 5 is a side elevation of the improved packet
30 shown in Figs. 3 and 4, illustrating the pliant
marginal flap portions thereof as they might be folded
back upon its main body portion.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Because certain parts of intraoral dental
5 radiographic film packets are well known, the following
description is directed in particular to those elements
forming, cooperating directly with, or relating to,
this invention. Elements not specifically shown or
described herein are selectable from those known in the
10 relevant art.

Figs. 1 and 2 illustrate an intraoral dental
radiographic film packet of a type known in the prior
art, e.g., as disclosed in the aforementioned U.S.
15 Patent No. 3,443,093, and to which the film packet
improvement of this invention is directed. The known
packet, designated generally by the letters FP,
comprises a sheet of x-ray film 10 having a sensitive
emulsion on one or both sides (as is well known in the
20 art); a folded black paper wrapper 12; a sheet of metal
foil 14 substantially the same shape and size as the
film sheet 10; and an enclosing envelope 16, preferably
plastic, within which the foregoing components are
arranged as shown and sealed. As is well known, the
25 envelope 16 may be made of a duplex plastic sheet,
i.e., a sheet of white plastic on the outside laminated
to a sheet of black plastic on the inside. The plastic
preferred for the envelope is polyvinylchloride,
although polyethylene, Pliofilm, cryovac, or other
30 plastic films or combinations of plastics might also be
used. The white outside surface of the envelope may be
matte, glossy, or embossed. The metal foil sheet 14
preferably is made of lead, but any metal that absorbs
x-rays satisfactorily for dental radiographic purposes
35 may be employed.

In the assembled film packet, as shown in Fig. 2, the paper wrapper 12 comprises a base section 12b underlying film sheet 10, a folded-over cover section 12c overlying film sheet 10, and a folded-over tab section 12t overlying the right-hand end portions of film sheet 10 and cover section 12c. It will be seen that metal foil sheet 14 lies between cover section 12c and tab section 12t. The plastic envelope 16 comprises a bottom wall 16b underlying the paper wrapper base section 12b, a cover section 16c overlying the metal foil sheet 14, and a flap section 16f overlying both the paper wrapper tab section 12t and the envelope cover section 16c. Cover section 16c and flap section 16f together form the top wall of the envelope. As shown in Fig. 1, the left-hand end portion of envelope flap section 16f is triangular in shape, to form a tab end 16ft of the flap section. Flap section 16f is tack-sealed to cover section 16c, transversely of the envelope as indicated by the undulated line 16TS. The envelope bottom wall 16b includes an upward-facing marginal area 16bm which is sealed to an opposing downward-facing marginal area 16cm of cover section 16c and an opposing downward-facing marginal area 16fm of flap section 16f. The seal may be provided in any suitable manner, e.g., by heat, ultrasonics, or an adhesive. To open the packet for processing film sheet 10 after its exposure, the technician first grasps the unsealed tab end 16ft of flap section 16f and then pulls the flap section upwardly, so as to break the transverse seal 16TS and rip open the seal between marginal areas 16fm and 16bm. With the envelope thus opened, the technician then grasps paper wrapper tab section 12t and pulls paper wrapper 12 out of the envelope with film sheet 10 riding between wrapper base and cover sections 12b and 12c.

With the envelope bottom wall 16b joined to the top wall cover and flap sections 16c and 16f along their opposing marginal areas as described, the envelope may
5 be viewed as comprising a main body portion 16MB surrounded by a perimetric edge portion 16PE, as shown most clearly in Fig. 2. It will be seen that the squared-off peripheral edge of perimetric edge portion 16PE includes relatively sharp top and bottom corners,
10 which have caused discomfort when pressed against sensitive oral tissues in some patients. The present invention provides an efficient and reliable means for ameliorating such discomfort.

15 As a comfort-enhancing improvement upon a film packet of the type thus far described, this invention comprises a deflectable lateral extension of at least part of the envelope perimetric edge portion 16PE, the extension projecting outwardly therefrom by an amount
20 rendering that part of the edge portion and the extension sufficiently flexible to be readily deflected when operatively positioned inside a patient's mouth, thereby cushioning the impact of the relatively sharply cornered envelope edge.

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In accordance with the preferred embodiment, and as shown most clearly in Fig. 3, the extension 16E is continuous around all of, and thus surrounds, the perimetric edge portion 16PE. It should be understood,
30 however, that this invention also contemplates alternative embodiments (not shown) wherein the extension may be discontinuous along, or project from only part(s) of, the perimetric edge portion. For example, such an extension could be provided only
35 around the envelope corners and/or along one or more of the envelope sides and ends.

As viewed in Figs. 2 and 4, the perimetric edge portion 16PE, from which extension 16E projects, has an edge portion thickness PEt, measured in a first direction Y perpendicular to the envelope bottom and top walls, and an edge portion width PEw, measured in a second direction X parallel with the envelope walls. Also as viewed in Figs. 2 and 4, the envelope main body portion 16MB has an overall thickness MBt, measured in first direction Y; and as seen in Fig. 4, the extension 16E projects laterally outward beyond the perimetric edge portion 16PE by an amount Ew measured in second direction X.

The extension amount, or width, Ew may be defined variously in terms of the perimetric edge portion thickness PEt, the main body portion overall thickness MBt, or/and the perimetric edge portion width PEw. Generally speaking, it has been found that the amount Ew should be approximately 20 times the edge portion thickness PEt. It also has been noted that Ew should be at least 2 times, but not more than 4 times, and preferably about 3 times, the body portion overall thickness MBt. It also has been observed that the width Ew should be at least 3 times, but not more than 7 times, and preferably between 4 and 6 times, the edge portion width PEw. Depending upon dimensional and material variations that might occur among differing film packets of this type, the foregoing relationships advantageously may be combined by defining the extension amount, or width, Ew as being approximately 20 times the edge portion thickness PEt, but no less than the greater of 3 times the edge portion width PEw and 2 times the overall thickness MBt, and no more than the lesser of 7 times the edge portion width PEw and 4 times the overall thickness MBt.

In a number of film packet samples analyzed, the envelope main body portion overall thickness MBt, as measured in first direction Y, ranged from about 0.056 inches (1.422 mm) to about 0.061 inches (1.549 mm), with a mean of about 0.058 inches (1.483 mm); the envelope perimetric edge portion thickness PEt, as measured in first direction Y, ranged from about 0.006 inches (0.157 mm) to about 0.012 inches (0.310 mm), with a mean of about 0.010 inches (0.246 mm); and the envelope perimetric edge portion width PEw, as measured in second direction X, averaged about 0.035 inches (0.889mm). Preferably, for packets having such dimensions, the envelope extension width Ew, as measured in second direction X, should range only from about 0.140 inches (3.556 mm) to about 0.210 inches (5.334 mm).

To facilitate understanding of this invention as an improvement upon a known dental film packet, Fig. 4 illustrates the envelope extension 16E as though it might comprise an additional part abutting the envelope perimetric edge portion 16PE. Although conceivably the extension could be a separate piece joined to the edge portion, in the preferred embodiment as successfully produced and tested, the extension is conveniently formed as an integral lateral continuation of the edge portion itself. That is, the envelope bottom and top walls 16b and 16c, 16f are simply made larger than before, to provide the desired extension width Ew, and their thus-enlarged upward-and downward-facing marginal areas are sealed together as before. Accordingly, Fig. 3 indicates only by phantom outline the periphery of the initial, unextended perimetric edge portion 16PE.

Fig. 5 illustrates the improved film packet FP' with its integrally extended perimetric edge portion appearing as a pair of oppositely projecting flexible flaps FF that have been deflected from their initial plane (shown in Fig. 4) and folded back upon the envelope main body portion 16MB. Although, for purposes of illustration, Fig. 5 shows the improved packet FP' with its left flap folded over and its right flap folded under the main body portion, it should be understood that either one or both of the flaps FF might be folded either way when the packet is appropriately positioned inside a patient's mouth. The curved portion C where each flap FF is folded, either way, around a body portion end provides an inherently resilient cushion to enhance patient comfort when that end of the packet is pressed against sensitive oral tissues. While not shown in Fig. 5, the same condition prevails when the enlarged lateral margins (top and bottom as viewed in Fig. 3) of the extended perimetric edge portion are similarly deflected and folded (again, either way) around the body portion sides, thereby providing the same cushioning effect regardless of the packet's orientation when operatively positioned inside the mouth. It should be noted that, during use, when the flexible flaps formed by extending the perimetric edge portion in accordance with this invention are deflected and folded back around the body portion ends or sides, toward the body portion top or bottom, to assume their cushioning configuration (such as that illustrated in Fig. 5), the overall length or width of the packet is not increased to an extent that would interfere with optimum positioning of the packet for the desired radiographic exposure.

It has been found that such an extension of the known packet's perimetric edge portion has proven effective in cushioning sensitive oral tissues from any discomfort that might otherwise be felt by some patients. The film packet improvement of this invention has thus successfully fulfilled the aforementioned widespread, long-recognized, but hitherto-unresolved need for a more comfortable intraoral dental radiographic film packet, and has done so without adversely increasing the packet's in-use size or resorting to a highly porous, saliva-absorbing material.

The present invention has now been described in detail with particular reference to its preferred embodiment illustrated herein. It will be understood, however, that variations and modifications can be effected within the spirit and scope of this invention.

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**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. A comfort-enhancing improvement upon an intraoral dental
5 radiographic film packet having sensitized film and protective opaque sheets
enclosed by a light-tight envelope that includes an opposed pair of generally parallel
walls covering the sheets, said walls being joined together along facing marginal
areas thereof surrounding the sheets, thereby defining a main body portion and a
perimetric edge portion of the envelope, said improvement being characterized by
10 a deflectable lateral extension of at least part of said perimetric edge portion, said
extension projecting outwardly therefrom by an amount rendering said at least part
of said edge portion and said extension sufficiently flexible to be readily deflected
when the packet so improved is operatively positioned for effecting an intraoral
radiographic exposure, and wherein said amount by which said extension so
15 projects is approximately twenty times said edge portion thickness dimension but
no less than the greater of three times said edge portion width dimension and twice
said overall thickness dimension.

2. A comfort-enhancing improvement as claimed in Claim 1 wherein said
20 at least part of said edge portion and said extension thereof define a pliant marginal
flap portion of the envelope, said flap portion being sufficiently pliant to be readily
deflected and folded back around part of said main body portion toward one of said
walls, thereby forming a curved resilient cushion where so folded, when the packet
so improved is operatively positioned for effecting an intraoral radiographic
25 exposure.

3. A comfort-enhancing improvement as claimed in Claim 1 wherein said
at least part of said perimetric edge portion is all of, and thus said extension projects
continuously from all of, said edge portion.

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4. A comfort-enhancing improvement as claimed in Claim 1 wherein said main body portion of the envelope has an overall thickness as measured perpendicular to said walls, and wherein said amount by which said extension projects outwardly from said at least part of said perimetric edge portion is at least twice said overall thickness.

5. A comfort-enhancing improvement as claimed in Claim 4 wherein said amount is no greater than four times said overall thickness.

6. A comfort-enhancing improvement as claimed in Claim 5 wherein said amount is approximately three times said overall thickness.

7. A comfort-enhancing improvement as claimed in Claim 1 wherein said perimetric edge portion of the envelope has an edge portion thickness as measured perpendicular to said walls, and wherein said amount by which said extension projects outwardly from said at least part of said perimetric edge portion is approximately twenty times said edge portion thickness.

8. A comfort-enhancing improvement as claimed in Claim 1 wherein said perimetric edge portion of the envelope has an edge portion width as measured parallel with said walls, and wherein said amount by which said extension projects outwardly from said at least part of said perimetric edge portion is at least three times said edge portion width.

9. A comfort-enhancing improvement as claimed in Claim 8 wherein said amount is no greater than seven times said edge portion width.

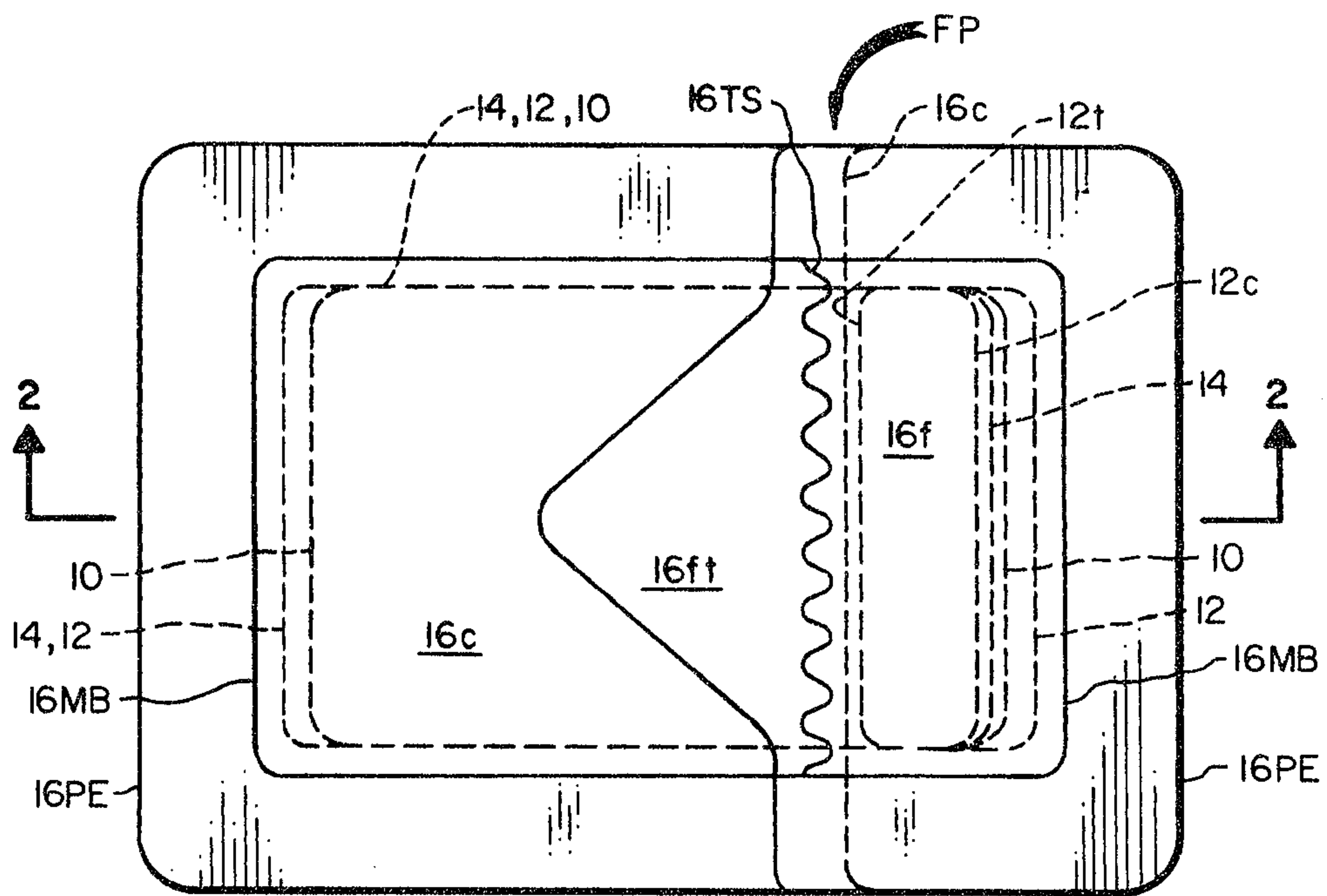
10. A comfort-enhancing improvement as claimed in Claim 9 wherein said amount is between four and six times said edge portion width.

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11. A comfort-enhancing improvement as claimed in Claim 1 wherein said main body portion of the envelope has an overall thickness dimension as measured in a first direction perpendicular to said walls, wherein said perimetric edge portion of the envelope has an edge portion thickness dimension as measured in said first direction and an edge portion width dimension as measured in a second direction parallel with said walls, wherein said extension projects outwardly from said at least part of said perimetric edge portion in said second direction, and wherein said amount by which said extension so projects is approximately twenty times said edge portion thickness dimension but no less than the greater of three times said edge portion width dimension and twice said overall thickness dimension.

12. A comfort-enhancing improvement as claimed in Claim 11 wherein said amount is no greater than the lesser of seven times said edge portion width dimension and four times said overall thickness dimension.

13. A comfort-enhancing improvement as claimed in Claim 1 wherein said main body portion of the envelope has an overall thickness ranging from 0.056 inches to 0.061 inches, wherein said perimetric edge portion of the envelope has an edge portion thickness (PEt) ranging from 0.006 inches to 0.012 inches and an edge portion width of 0.035 inches, and wherein said amount by which said extension projects outwardly from said at least part of said perimetric edge portion ranges from 0.140 inches to 0.210 inches.



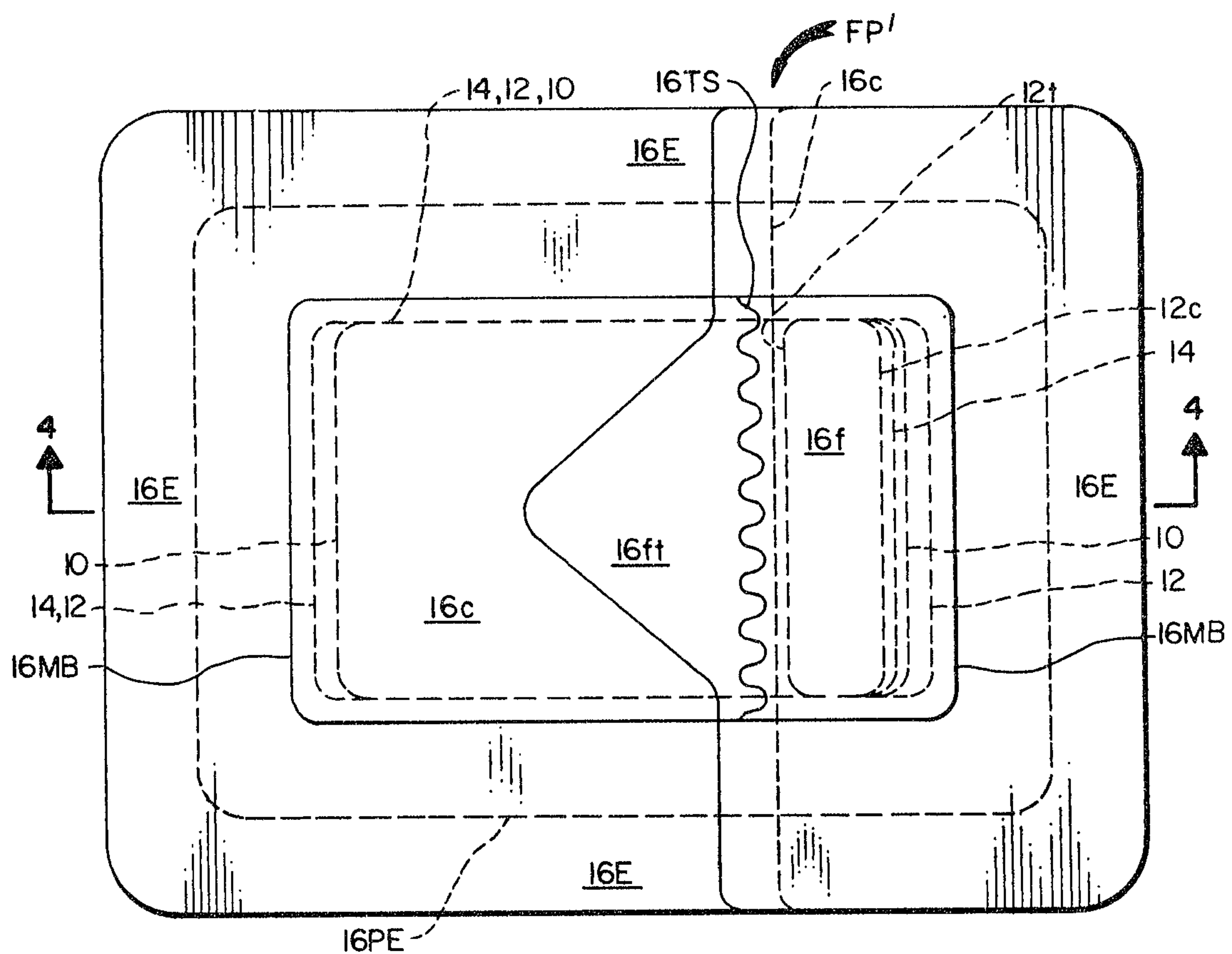


FIG. 3

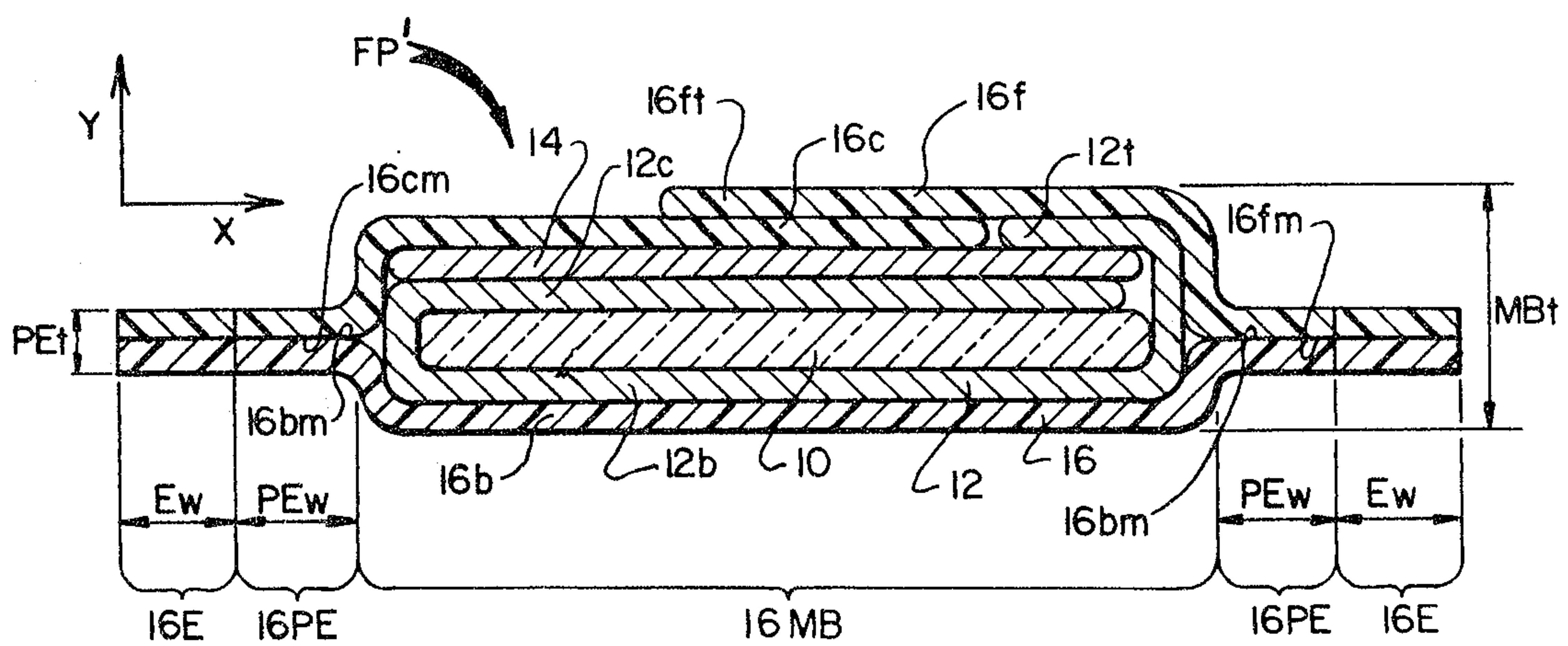


FIG. 4

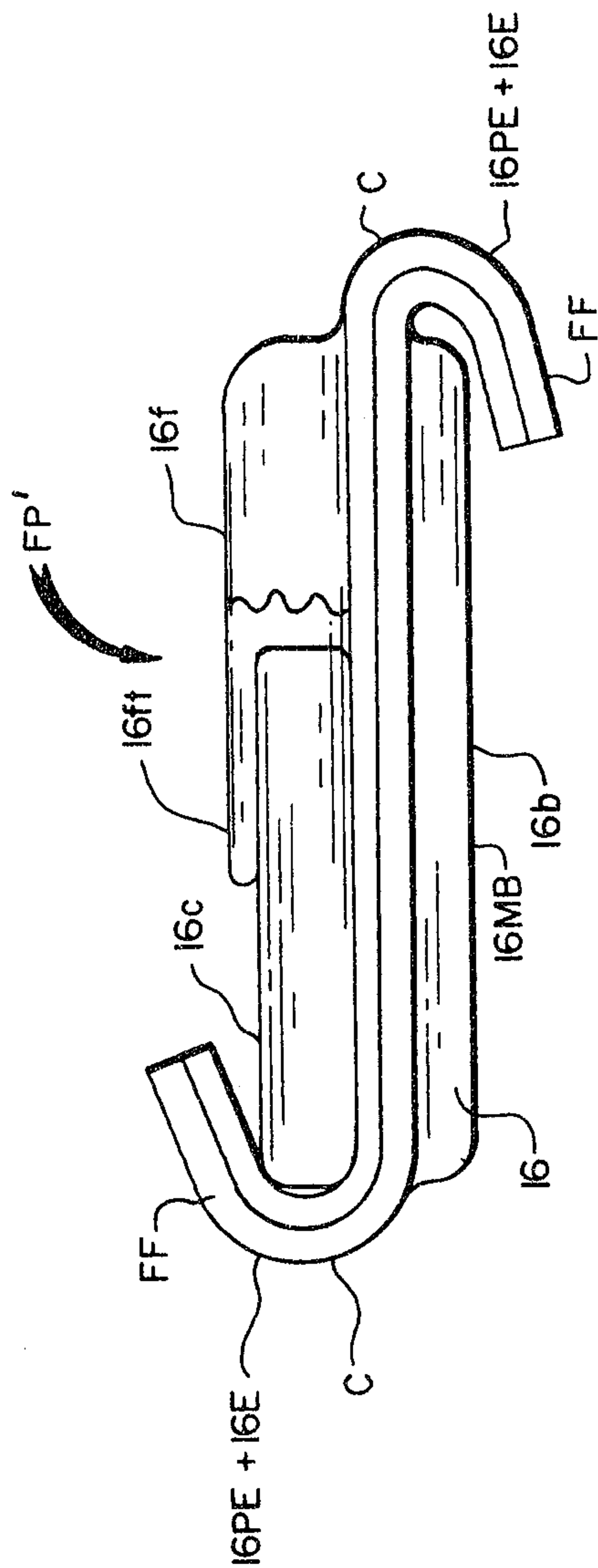


FIG. 5

