Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2568111 C 2014/04/01

(11)(21) 2 568 111

(12) BREVET CANADIEN
CANADIAN PATENT

(13) C

(22) Date de dépôt/Filing Date: 2006/11/14

(41) Mise à la disp. pub./Open to Public Insp.: 2008/05/14

(45) Date de délivrance/Issue Date: 2014/04/01

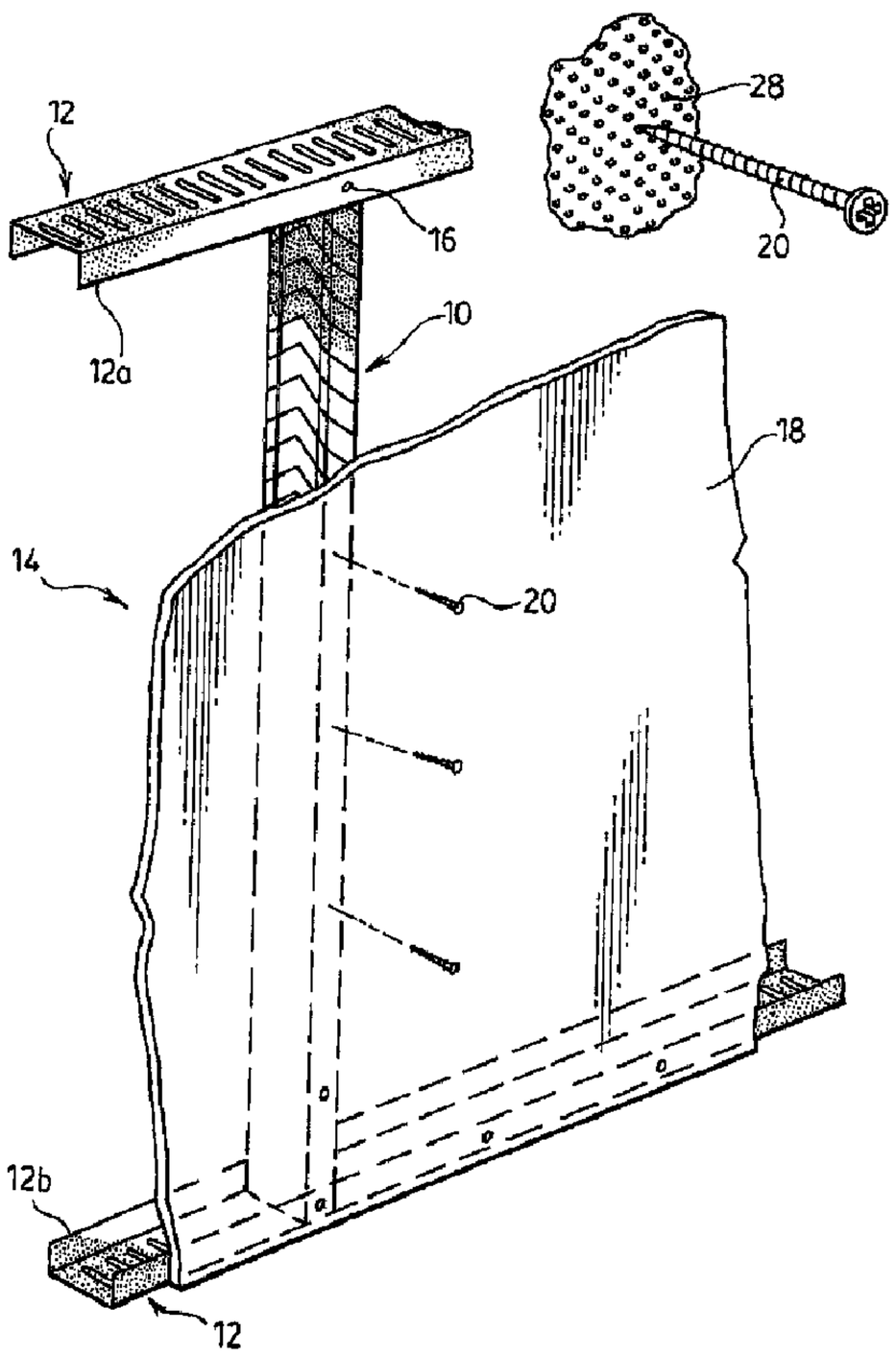
(51) Cl.Int./Int.Cl. *E04C 3/07* (2006.01), *B21D 13/04* (2006.01), *B21D 47/00* (2006.01), *E04C 3/06* (2006.01), *E04C 3/09* (2006.01)

(72) Inventeur/Inventor:
HOWCHIN, ROBERT, CA

(73) Propriétaire/Owner:
BAILEY METAL PRODUCTS LIMITED, CA

(74) Agent: DENNISON ASSOCIATES

(54) Titre : PIECE LEGERE DE CHARPENTE METALLIQUE
(54) Title: LIGHT WEIGHT METAL FRAMING MEMBER



(57) Abrégé/Abstract:
The present invention provides for a lightweight metal framing member having a plurality of depressions and a plurality of reinforcing ribs on the surface thereof, the depressions and ribs both being inwardly oriented and cooperating to aid in stiffening of

CA 2568111 C 2014/04/01

(11)(21) 2 568 111

(13) C

(57) Abrégé(suite)/Abstract(continued):
the metal stud. The present invention also provides a method of manufacturing a metal framing member having a plurality of depressions and a plurality of reinforcing ribs on the surface thereof, the depressions and ribs both being inwardly oriented and cooperating to aid in stiffening of the metal stud. The method utilizes a cold roll forming apparatus having a first roller with a plurality of projections on its surface and a second roller having a surface provided with holes aligned with the projections on the surface of the first roller to form the depressions in the surface of the material having clearly defined edges generally aligned with the plane of the metal sheet. A second roll forming apparatus is used having a first roller with projections on its surface to form the reinforcing ribs in the surface of the sheet material and a second roller to allow for a softer transition between the surface of the sheet material and the edges of the reinforcing ribs and so as not to unduly deform the depressions formed in the first roll forming step. A third roll forming apparatus is used having rollers to form the metal stud or track.

JJ-13 014CA

ABSTRACT OF THE DISCLOSURE

The present invention provides for a lightweight metal framing member having a plurality of depressions and a plurality of reinforcing ribs on the surface thereof, the depressions and ribs both being inwardly oriented and cooperating to aid in stiffening of the metal stud. The present invention also provides a method of manufacturing a metal framing member having a plurality of depressions and a plurality of reinforcing ribs on the surface thereof, the depressions and ribs both being inwardly oriented and cooperating to aid in stiffening of the metal stud. The method utilizes a cold roll forming apparatus having a first roller with a plurality of projections on its surface and a second roller having a surface provided with holes aligned with the projections on the surface of the first roller to form the depressions in the surface of the material having clearly defined edges generally aligned with the plane of the metal sheet. A second roll forming apparatus is used having a first roller with projections on its surface to form the reinforcing ribs in the surface of the sheet material and a second roller to allow for a softer transition between the surface of the sheet material and the edges of the reinforcing ribs and so as not to unduly deform the depressions formed in the first roll forming step. A third roll forming apparatus is used having rollers to form the metal stud or track.

JJ-13 014CA

TITLE: LIGHT WEIGHT METAL FRAMING MEMBER

FIELD OF THE INVENTION:

The present invention relates to metal framing members for use in constructing partition walls. In particular, the invention relates to metal studs and tracks for use in partition walls wherein the stud or track is provided with one or more patterns of projections to stiffen the material utilized in forming the metal stud or track and to enhance screw gripping.

BACKGROUND OF THE INVENTION:

It is common practice in residential and many commercial buildings to separate the various rooms by partition walls to define the space of the room. Such partition walls are generally load bearing and have in the past been constructed of wood members including top and bottom plates and bridging studs. The use of wood members has its shortcomings, the supply of lumber is getting scarce, costs have increased during recent years. In addition, wood can warp and go out of shape when it becomes wet as well as being susceptible to fire damage and attack by vermin of various kinds.

In recent years, partition walls framed with sheet metal members have been employed. The use of sheet metal members provides advantages of dimensional stability, ease of manufacturing and conservation of natural resources among others. However, the use of sheet metal framing members has not gained widespread acceptance for various reasons. For example, the cost of the materials utilized to form metal studs has been increasing and the price advantages of metal studs over wood studs is decreasing. There have been attempts in the past to reduce the cost of the material utilized to form the metal stud by providing stiffening structures to the metal to allow a thinner and less expensive metal to be used for a particular duty. For example, Swiss Patent CH486281 describes a sheet material having rows of alternating projections and depressions, the rows of the projections and depressions offset such that the projections and depressions alternate along the length of the material. Similarly, Canadian Patent Application No. 2, 149,914 describes a stud for use in partition walls where the sheet material to form the stud is provided with projections on opposite surfaces of the material to leave a

corresponding depression at the opposite face of the material, the positions of the projections and depressions at each surface of the material being such that lines drawn on the surface of the material between adjacent rows of projections and depressions are not rectilinear. While this arrangement is said to allow the production of studs from a thinner starting material, the manufacturing process required two offset rollers each being provided with projections to form the projections and depressions on opposite sides of the metal sheet.

Another problem with the use of metal framing members is that as the screws are being driven into the metal framing member, there is a tendency for the flange of the stud or track to deflect from the screw tip pressure and the tip of the screw may slip along the surface of the metal framing member and not be properly driven through the metal framing member at a generally perpendicular angle. Angular screw gripping is especially critical when applying wall sheeting material since often when a screw is being installed, the side of the stud or track may deflect as pressure is applied to install the screw. The deflection of the side wall will create an angle between the screw and the sidewall, even if the screw is applied at right angles to the wall sheeting material. In the past, manufacturers of metal studs have provided a dimpling on the surfaces of the metal stud to capture the tip of the screw and reduce the tendency of the screw to slip along the surface, but such dimpling creates negligible increased stud strength.

There still remains a need for a lightweight metal framing member which overcomes the disadvantages of the prior art.

SUMMARY OF THE INVENTION:

The present invention provides for a lightweight metal framing member having a plurality of depressions and a plurality of reinforcing ribs on the surfaces thereof, the depressions and ribs both being inwardly oriented and cooperating to significantly aid in stiffening of the metal framing member.

In an aspect of the present invention, there is provided a metal framing member having a plurality of inwardly oriented depressions on the surfaces of the framing member to aid in stiffening of the metal frame member and enhance screw tip capture. Each of the depressions are formed with clearly defined edges to enhance screw tip capture of a

screw entering the depression irrespective of the angle of entry into the depression of the screw tip.

In an aspect of the invention, the metal framing member is a stud having a generally rectangular C shaped cross section with two parallel spaced apart side walls and a central web bridging the side walls with the side walls terminating in inturned flanges or ledges. Each of the side walls, ledges and central web are provided with the plurality of depressions and reinforcing ribs.

In another aspect of the invention, the metal framing member is a track having a generally rectangular U shaped cross section with two parallel spaced apart side walls and a central web bridging the side walls. Each of the side walls and central web are provided with the plurality of depressions and the web is provided with a plurality of reinforcing ribs.

In another aspect of the invention, the central web bridging the side walls is in the form of a main central section bordered by raised narrow channel shaped edge ribs.

In another aspect of the invention, each of the depressions has a depth about 2 to 4 times the thickness of the metal from which the framing member is formed.

In another aspect of the invention, each of the depressions are round or knurled and have a diameter of about 0.10 inches.

In another aspect of the invention, the depressions are provided as a series of rows across the surface of the metal framing member.

In another aspect of the invention, the rows of depressions are offset from each other so that the depressions form a diamond pattern on the surface of the sheet material such that the rows can be moved closer together, increasing the number of depressions for reinforcement and screw attachment.

In another aspect of the invention, the spacing between the rows of depressions is about 0.10 inches and the spacing between the depressions in each row is about 0.20 inches.

JJ-13 014CA

In another aspect of the invention, the ribs on the surfaces of the stud, except for the narrow edge ribs are arranged diagonally across at least one half of the width and depth of the stud.

In another aspect of the invention, the ribs have a width of about 0.20 to 0.30 inches wide, preferably about 0.25 inches wide and a depth of about 0.05 to 0.15 inches deep preferrably about 0.10 inches deep.

In another aspect of the invention, there is provided a method of manufacturing a metal framing member having a plurality of depressions and a plurality of reinforcing ribs on the surface thereof, the depressions and ribs both being inwardly oriented and cooperating to aid in stiffening of the metal framing member. The method comprises passing a suitably dimensioned sheet material through a cold roll forming apparatus having a first roller with a plurality of projections on its surface to press into the sheet metal material and form the depressions in the surface of the material and a second roller having holes corresponding to the projections of the first roller to provide well defined edges to the depressions. The sheet material is then passed through a second roll forming apparatus having a first roller with projections on its surface to form the reinforcing ribs in the surface of the sheet material and a second roller having a surface to allow for a softer transition between the surface of the sheet material and the edges of the reinforcing ribs as well as to not unduly deform the depressions within the rib. The sheet material is then passed through a third roll forming apparatus having rollers to form the metal framing member.

BRIEF DESCRIPTION OF THE DRAWINGS:

Preferred embodiments of the invention are illustrated in the attached drawings in which:

Figure 1 is a perspective view of a wall constructed utilizing a preferred embodiment of the lightweight metal stud and track of the present invention being used to frame a partition wall;

Figure 2 is a perspective view of a first preferred embodiment of a lightweight metal stud of the present invention;

JJ-13 014CA

Figure 3 is a perspective view of a second preferred embodiment of a lightweight metal stud of the present invention;

Figure 4 is a perspective view illustrating the capture of a screw tip by the depression on the surface of the metal stud or track;

Figure 5 is a cross section view illustrating the capture of a screw tip by the depression on the surface of the metal stud or track;

Figure 6 is perspective view of a preferred embodiment of a lightweight metal track of the present invention;

Figure 7 is a perspective view of the depression being applied to the surface of the metal sheet which is to be formed into a stud or track;

Figure 8 is a side elevation view in cross-section illustrating the forming of the depression on the surface of the metal sheet;

Figure 9 is a side elevation view in cross-section of the metal sheet having the depressions formed therein;

Figure 10 is a perspective view of the reinforcing ribs which extend across the metal sheet being applied to the sheet;

Figure 11 is a side elevation view in cross-section illustrating the forming of the reinforcing ribs in surface of the metal sheet using a compressible surface roller;

Figure 12 is a side elevation view in cross-section of the metal sheet with the depressions and reinforcing ribs formed therein; and

Figure 13 is a side elevation view in cross section illustrating the forming of the reinforcing ribs in the surface of the metal sheet using an air bending roller.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

JJ-13 014CA

The present invention is directed to metal framing members such as metal studs 10 and tracks 12 utilized in framing partition walls 14 as illustrated in Figure 1. The partition walls 14 are framed from a metal track 12 forming the top plates 12a and bottom plates 12b that are bridged by the parallel spaced apart metal studs 10. The spacing between the metal studs 10 is that typically utilized in construction of walls generally at 16 inches on center although other spacing such as 24 inches on center may be utilized. The studs 10 are attached to the top plate 12a and bottom plate 12b through the use of suitable screws 16. Once the partition wall 14 is framed utilizing the studs 10, top plate 12a and bottom plate 12b, a suitable wall covering material such as wall board 18 is attached to the partition wall utilizing suitable screws 20.

As illustrated in Figures 2 and 3, the metal stud 10 has a generally C-shaped rectangular cross-section with two parallel spaced apart side walls 22 and a central web 24 bridging the side walls 22. The side walls 22 terminate in inwardly turned ledges 26. The central web 24 has a main central section 24a bordered by channel shaped ribs 24b extending longitudinally of the stud 10. The longitudinal ribs 24b extend outwardly of the stud 10 and aid in stiffening of the central web 24 of the stud 10.

The surface of the metal sheet from which the metal stud 10 or tracks 12 is formed is provided with a plurality of depressions 28 formed therein to aid in stiffening of the metal from which the stud 10 or track 12 is formed. As illustrated in Figures 4 and 5, the depressions 28 also aid in preventing slipping of a screw 20 as it is being driven into the metal stud 10 or track 12 irrespective of the direction in which the screw tip enters the depression 28. Typically as a screw 20 is being driven into the flange or side wall 22 of a stud 10 or track 12, the pressure of the screw tip tends to deflect the sidewall, allowing the screw tip to slip along the surface. As illustrated in Figures 4 and 5, the shaping and dimensions of the depressions 28 capture the screw tip, even when the sidewall 22 is deforming and significantly reduces or elimates the possibility of screw tip slippage.

In addition to the depressions 28, the metal from which the stud 10 or track 12 is formed is also preferably provided with a plurality of reinforcing projections such as ribs 30 which extend across at least a portion of the sheet to further aid in stiffening of the material from which the stud 10 or track 12 is formed. Figures 2 and 3 illustrate two preferred embodiments of studs of the present invention with two different patterns of ribs on the surface. The stud 10 illustrated in Figure 2 has the ribs 30 arranged in a

herringbone or chevron pattern, while the stud 10 illustrated in Figure 3 has the ribs 30 arranged in a crossed diagonal or quilted pattern. As explained below, other patterns may also be utilized.

Each of the depressions 28 and the reinforcing ribs 30 are formed on the same surface of the material from which the stud 10 or track 12 is to be formed such that the depressions 28 and reinforcing ribs 30 are oriented to the inside of the formed metal stud 10 or track 12. In this way, the depressions 28 and ribs 30 do not interfere with the placing of the metal stud 10 within the top 12a and bottom plates 12b nor do they interfere with the placement of the covering materials 18 on the formed walls 14. An additional benefit of the provision of the depressions 28 on both the stud 10 and track 12 is that as the stud 10 is placed within the track 12, the depressions 28 of the stud 10 and track 12 interlock to help hold the stud 10 in the desired location within the track 12 during the framing of the partition walls 14.

Figure 6 illustates a typical track 12 of the present invention which is utilized as a top track 12a or bottom track 12b in forming a partition wall 14. Track 12 has a generally rectangular U shape with two parallel spaced apart side walls 32 and a central web 34 bridging the side walls 32. Similar to the stud 10, the track 12 is provided with a plurality of depressions 28 formed therein to aid in stiffening of the metal from which the track 12 is formed. In addition to the depressions 28, the metal from which the track 12 is formed is also provided with a plurality of reinforcing projections such as ribs 30 which extend across a portion of the central web 34 to further aid in stiffening of the material from which the track 12 is formed. Preferably, the ribs 30 are centrally located in the central web 34 and have a length of about 1 to 2 inches. As explained further below, the ribs 30 may also be utilized for indexing of the track length for ease of cutting the track 12 in the field to the desired length as well as for placement of the studs 10 at the proper spacing within the track 12. By providing the ribs 30 across only a portion of the central web 34 of the track 12, the ribs 30 do not interfere with the placement of the studs 10 within the track 12.

Figures 7 through 9 illustrate the first step in the processing of the metal sheet from which the stud 10 or track 12 is to be constructed. A metal sheet 38 of a suitable thickness is passed through a cold roll forming apparatus having a first roller 40 with a plurality of projections 42 on its surface to press into the sheet metal material 38 and form the depressions 28 in the surface of the material. The second roller 44 of this roll

forming apparatus has a surface provided with holes 46 aligned with the projections 42 on the surface of the first roller 40. In this way, the depressions 28 being formed by the rollers 40 and 44 having aligned projections 42 and holes 46 have clearly defined edges 48 generally aligned with the plane of the metal sheet 38. This is illustrated in detail in Figure 9 where it is shown that the edges 48 between the surface of the sheet material 38 and the depressions 28 are clearly defined sharp corners. The provision of the clearly defined edges 48 generally aligned with the plane of the metal sheet 38 allows a screw tip to be captured in the depression 28 at all angles and reduces or virtually eliminates any slipping of a screw 16 or 20 as it is being driven into the framing member.

The number, size, spacing and shape of the depressions 28 is selected to provide the desired reinforcement to the sheet material from which the stud or track will be formed. Preferrably, as illustrated in the figures, the depressions 28 are provided as a series of rows offset from each other so that the depressions 28 form a diamond pattern on the surface of the sheet material. By offsetting the rows of depressions 28, the depressions 28 can be placed closer together, providing a larger number of depressions 28 on the metal sheet 38 increasing the reinforcement of the metal sheet 38 as well as further reducing the possibility of screw tip slippage. The spacing between the rows of depressions 28 is typically on the order of about 0.10 inches and the depressions 28 are spaced apart in the row about 0.20 inches. Thus, the depressions 28 adjacent each other in adjacent rows would be spaced apart about 0.144 inches. While these dimensions are preferred, variations of the dimensions may be used. While various shapes of the depressions can be selected such as circular, oval or diamond, preferrably, each of the depressions 28 is circular in shape having a diameter of approximately 0.10 inches and a depth of approximately 0.03 to 0.06 inches deep, preferrably about 0.04 to 0.05 inches deep. For a typical metal sheet 38, this results in the projections on the opposite side of the metal sheet 38 having a thickness of approximately 2-4 times the thickness of the metal sheet material.

Once the depressions 28 are formed in the metal sheet material 38, the metal sheet material 38 is then passed through a second roll forming apparatus having a first roller 50 with projections 52 on its surface to form the reinforcing ribs 30 in the surface of the sheet material 38. This second apparatus also has a second roller 54 which allows for a softer transition between the surface of the sheet material and the edges of the reinforcing ribs 30. As shown in Figure 13, the second roller 54 could be provided with an enlarged opening to allow for air bending of the rib 30 or as shown in Figures 10 and

11, it could be provided with a compressible surface such as polyurethane. The use of such a second roller 54 provides that any of the depressions 28, especially those which are within the ribs 30 are not unduly deformed or flattened out as would be the case if the second roller was a hard material. Rather the depressions 28 remain generally intact within the interior of the reinforcing rib 30. This provides for further reinforcement to the metal sheet material 38 as well as retaining the screw gripping property of the depressions 28 within the rib 30. Preferably, to fully retain the screw gripping property of the rib 30, the rollers of the second apparatus are oriented such that a row of screw gripping depressions 28 will be present and formed in the apex of every rib 30.

As illustrated in the figures, preferrably the ribs 30 have a width approximately 0.20 to 0.3 inches wide, preferably about 0.25 inches wide and a depth approximately 0.05 to 0.15 inches deep preferrably about 0.1 inches deep.

Once the sheet material 38 has been passed through the roll forming apparatus to form the depressions 28 and reinforcing ribs 30 in the surface, it is then passed through the typical roll forming apparatus to form the final C-channel shape of the metal stud 10 or U-channel shape of the track 12.

While in the preferred embodiment illustrated, the reinforcing ribs 30 which extend across the metal sheet from which the stud 10 is formed are a herringbone or chevron shape or a quilted pattern, other shapes of reinforcing ribs 30 may also be provided which will provide for the required stiffening of the sheet material 38. For the track 12, preferably the ribs 30 extend horizontally across only a portion of the surface of the material 38 from which the central web 34 of the track 12 is formed and do not extend to the sidewalls 32. The absence of ribs 30 adjacent to or on the sidewalls 32 of the track 12 allows for a better fit between the stud 10 and track 12 and better interlock of the stud and track depressions 28. By eliminating the ribs 30 in the vertically oriented sidewalls 32 of the track 12, the stud 10 and track 12 will interlock on assembly and the depressions 28 on the stud 10 and track 12 being equally spaced will also interlock providing free standing stud location until the screws 16 are applied to firmly join the stud 10 and track 12. In addition, by the proper spacing of the ribs 30, the ribs 30 may also be utilized for indexing of the track length for ease of cutting the track 12 in the field to the desired length as well as for placement of the studs 10 at the proper spacing within the track 12. For example, the ribs 30 could be provided every 1 inch along the length of the track 12 to provide a built in indexing ruler for the track.

JJ-13 014CA

The method and apparatus used to form the depressions and reinforcing ribs 30 is usable with any size stud 10 or track 12 because of the orientation and pattern of the depressions 28 and reinforcing ribs 30. In this way, separate apparatus are not needed to produce the typical 1 5/8, 2 1/2 inch, 3 5/8 inch, 6 inch or 8 inch studs and tracks. Rather, the feed fences for the apparatus are adjusted such that the sheet material for forming the stud or track is fed centered on the rollers of the roll forming apparatus.

The metal framing members of the present invention provide for a metal stud and track having increased strength compared to metal studs and tracks made from plain sheet material of the same thickness. In addition, the provision of the depressions on the surface of the metal framing member as well as the shaping of the depressions allows for capture of the tip of the screw as it is being driven through the metal framing member reducing the likelihood of the screw slipping along the surface of the metal framing member irrespective of angle at which the screw tip encounters the sidewall as a result of the sidewall deflection during assembly causing an angular intersection between the screw tip and the sidewall .

Although various preferred embodiments of the present invention have been described herein in detail, it will be appreciated by those skilled in the art that variations may be made thereto without departing from the scope of the appended claims.

WHAT IS CLAIMED IS:

1. A lightweight metal framing member formed from a sheet of metal having a plurality of round depressions provided on the entire surface of the sheet of metal the depressions having a depth of 2 to 4 times the thickness of the sheet of metal and a plurality of reinforcing ribs extending across the surface of the sheet of metal, the depressions having clearly defined edges to enhance screw tip capture of a screw entering the depression irrespective of the angle of entry into the depression of the screw tip the depressions and ribs both being inwardly oriented and cooperating to aid in stiffening of the metal framing member.

2. A lightweight metal framing member according to claim 1, wherein the metal framing member is a metal stud having a generally rectangular C shaped cross section with two parallel spaced apart side walls and a central web bridging the side walls, said side walls terminating in inturned ledges.

3. A lightweight metal stud according to claim 2, wherein each of the depressions has a diameter of about 0.10 inches.

4. A lightweight metal stud according to claim 3, wherein the depressions are provided as a series of rows across the surface of the metal sheet from which the stud was formed.

5. A lightweight metal stud according to claim 4, wherein the rows of depressions are offset from each other so that the depressions form a diamond pattern on the surface of the sheet material from which the stud was formed and may be located closer together.

6. A lightweight metal stud according to claim 5, wherein the spacing between the rows of depressions is about 0.10 inches and the spacing between the depressions in each row is about 0.20 inches.

7. A lightweight metal stud according to claim 6, wherein the ribs are arranged diagonally across at least one half of the width of the metal sheet from which the stud was formed.

8. A lightweight metal stud according to claim 7, wherein the ribs have a width of about 0.20 to 0.3 inches wide, and a depth of about 0.05 to 0.15 inches deep.

9. A lightweight metal stud formed from a sheet of metal having rows of round depressions provided on the entire surface of the sheet metal the depressions having a depth of 2 to 4 times the thickness of the sheet of metal and rows of reinforcing ribs extending across the surface thereof, the depressions having clearly defined edges to enhance screw tip capture of a screw entering the depression irrespective of the angle of entry into the depression of the screw tip the depressions and ribs being inwardly oriented and cooperating to stiffen said sheet, said metal stud formed from said sheet having a generally rectangular C cross-section having a central web between spaced side walls, said side walls terminating in inturned ledges.

10. A lightweight metal stud as claimed in Claim 9 in which said central web comprises a main central section bordered by channel shaped ribs extending longitudinally of said stud, said longitudinal channel shaped ribs projecting beyond said main central web section in a direction opposite to the inwardly oriented rows of reinforcing ribs and projections.

11. A lightweight metal stud according to Claim 10 wherein each of the depressions has a diameter of about 0.10 inches.

12. A lightweight metal stud according to Claim 11 wherein the rows of depressions are offset from each other so that the depressions are closer together and form a diamond pattern on the surface of the sheet material from which the stud was formed.

13. A lightweight metal stud according to Claim 10 wherein the spacing between the rows of depressions is about 0.10 inches and the spacing between the depressions in each row is about 0.20 inches.

14. A lightweight metal stud according to Claim 13 wherein the ribs are arranged diagonally across at least one half of the width of the metal sheet from which the stud was formed.

15. A lightweight metal stud according to Claim 14 wherein the ribs have a width of about 0.20 to 0.3 inches, and a depth of about 0.05 to 0.15 inches.

16. A lightweight metal framing member according to claim 1, wherein the metal framing member is a metal track having a generally rectangular U shaped cross section with two parallel spaced apart side walls and a central web bridging the side walls.

17. A lightweight metal track according to claim 16, wherein each of the depressions has a diameter of about 0.10 inches.

18. A lightweight metal track according to claim 17, wherein the depressions are provided as a series of rows across the surface of the metal sheet from which the track was formed.

19. A lightweight metal track according to claim 18, wherein the rows of depressions are offset from each other so that the depressions are closer together and form a diamond pattern on the surface of the sheet material from which the track was formed.

20. A lightweight metal track according to claim 19, wherein the spacing between the rows of depressions is about 0.10 inches and the spacing between the depressions in each row is about 0.20 inches.

21. A lightweight metal track according to claim 20, wherein the ribs are arranged horizontally across a portion of the width of the metal sheet from which central web of the track was formed.

22. A lightweight metal track according to claim 21, wherein the ribs have a width of about 0.20 to 0.3 inches wide, and a depth of about 0.05 to 0.15 inches deep.

23. A lightweight metal track according to claim 22, wherein the ribs are evenly spaced along the length of the web of the track to provide an indexing of the length of the track.

24. A lightweight metal framing member formed from a sheet of metal having a plurality of round depressions provided on the entire surface thereof, the depressions having a depth about 2 to 4 times the thickness of the sheet of metal, and being inwardly oriented to aid in stiffening of the metal framing member and having clearly defined edges to enhance screw tip capture of a screw entering the depression irrespective of the angle of entry into the depression of the screw tip.

25. A lightweight metal framing member according to claim 24, wherein each of the depressions has a diameter of about 0.10 inches.

26. A lightweight metal framing member according to claim 25, wherein the depressions are provided as a series of rows across the surface of the metal sheet from which the stud was formed.

27. A lightweight metal framing member according to claim 26, wherein the rows of depressions are offset from each other so that the depressions form a diamond pattern on the surface of the sheet material from which the framing member was formed and may be located closer together.

28. A lightweight metal framing member according to claim 27, wherein the spacing between the rows of depressions is about 0.10 inches and the spacing between the depressions in each row is about 0.20 inches.

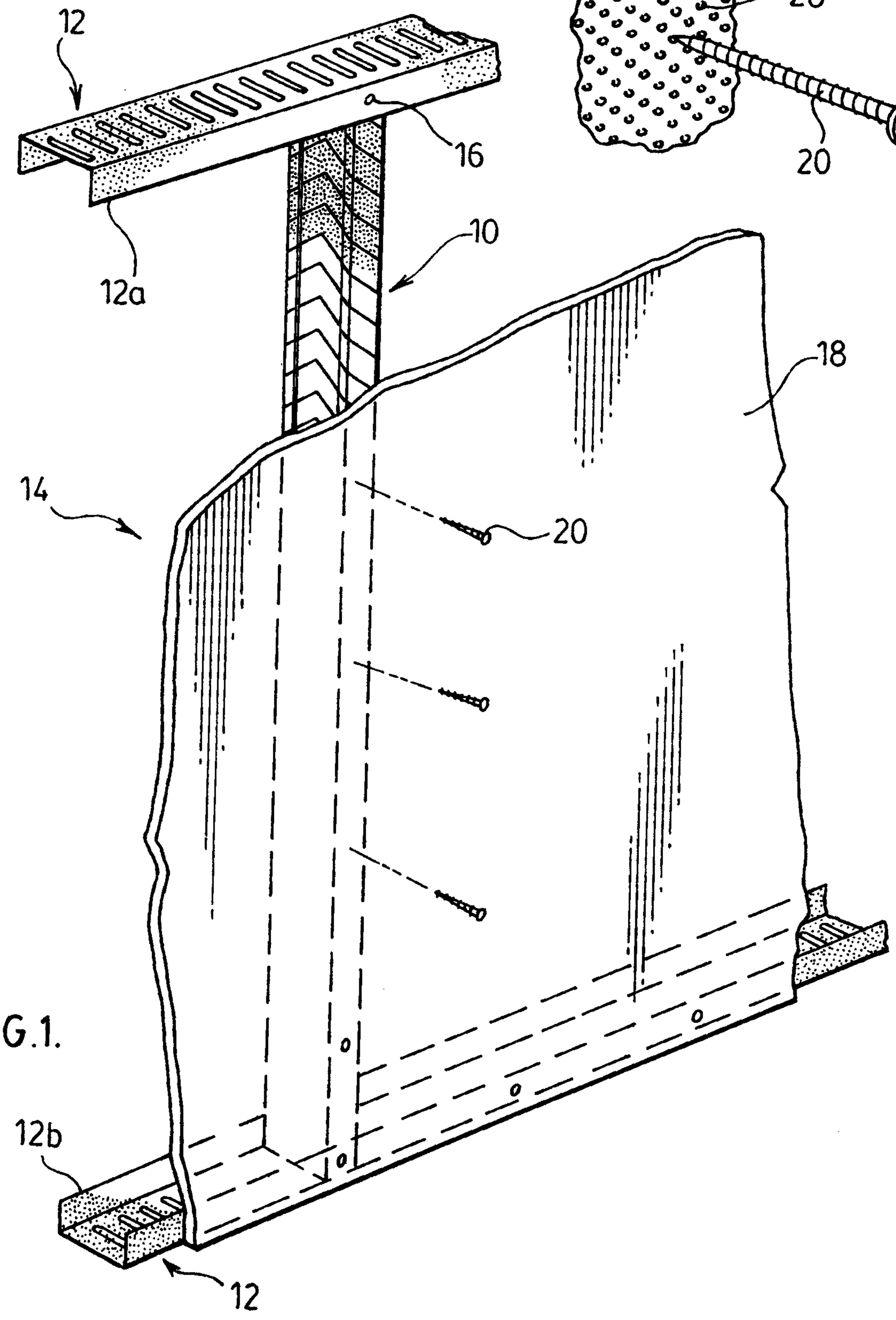


FIG.1.

FIG.4.

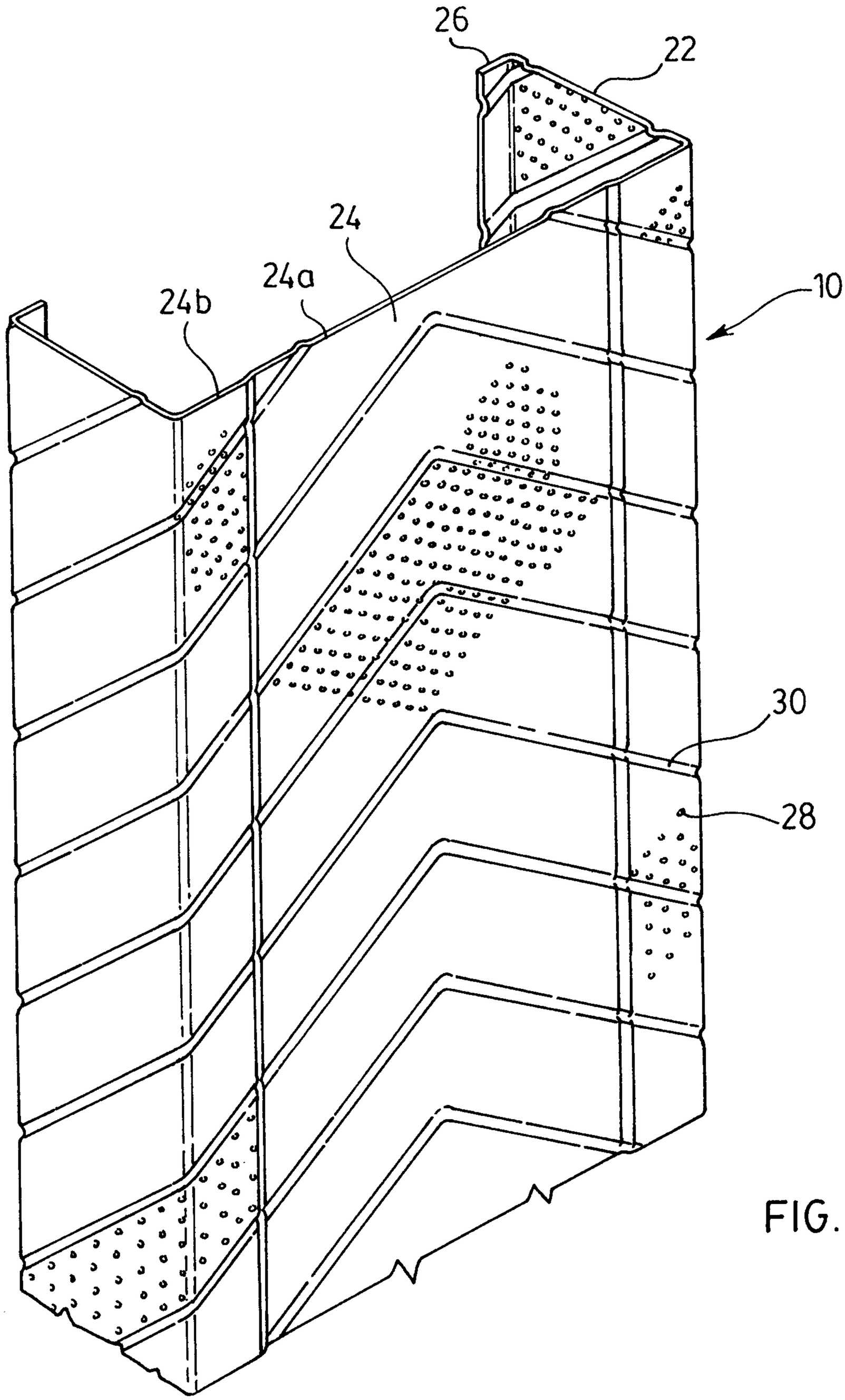


FIG. 2.

FIG. 3.

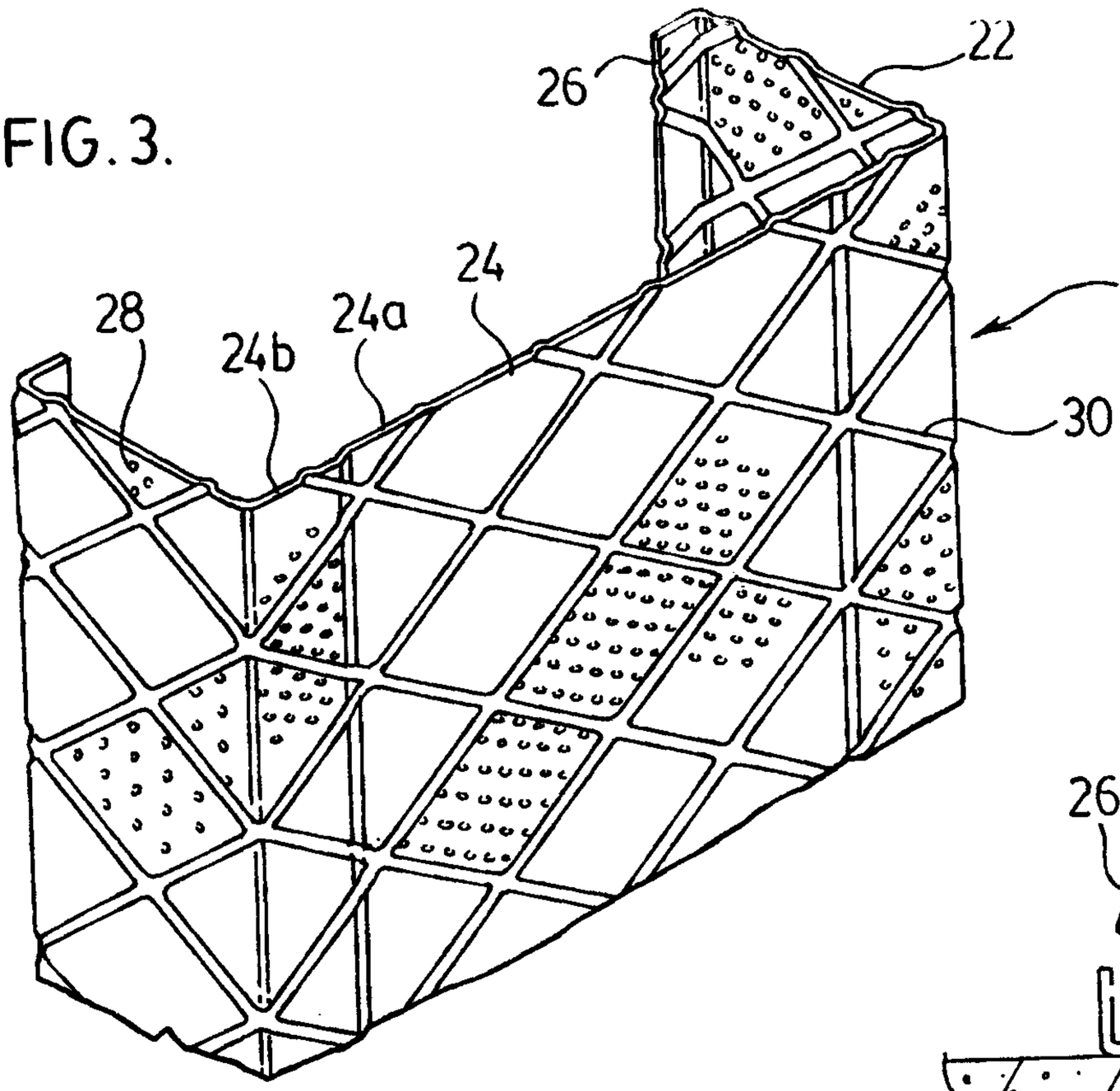


FIG. 5.

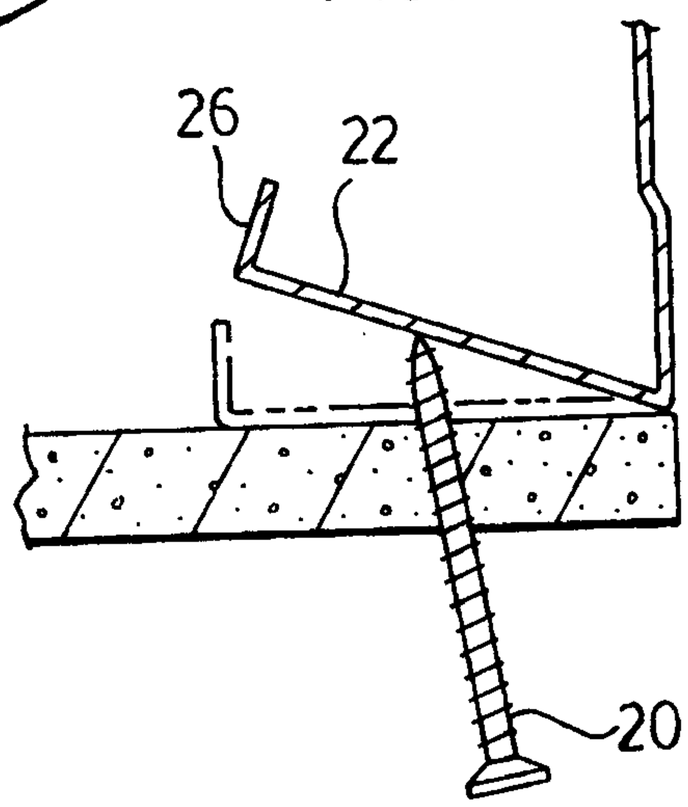
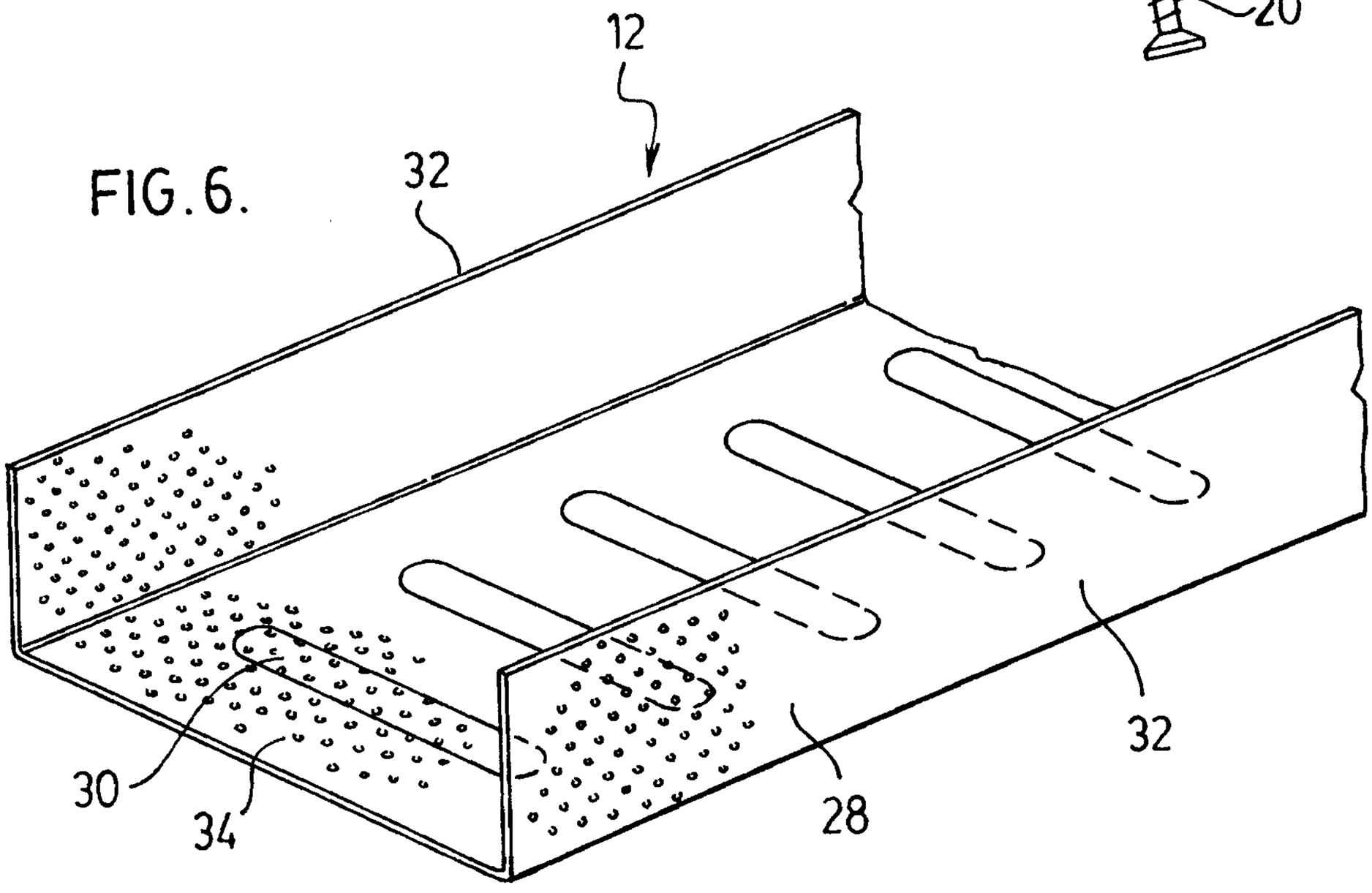


FIG. 6.



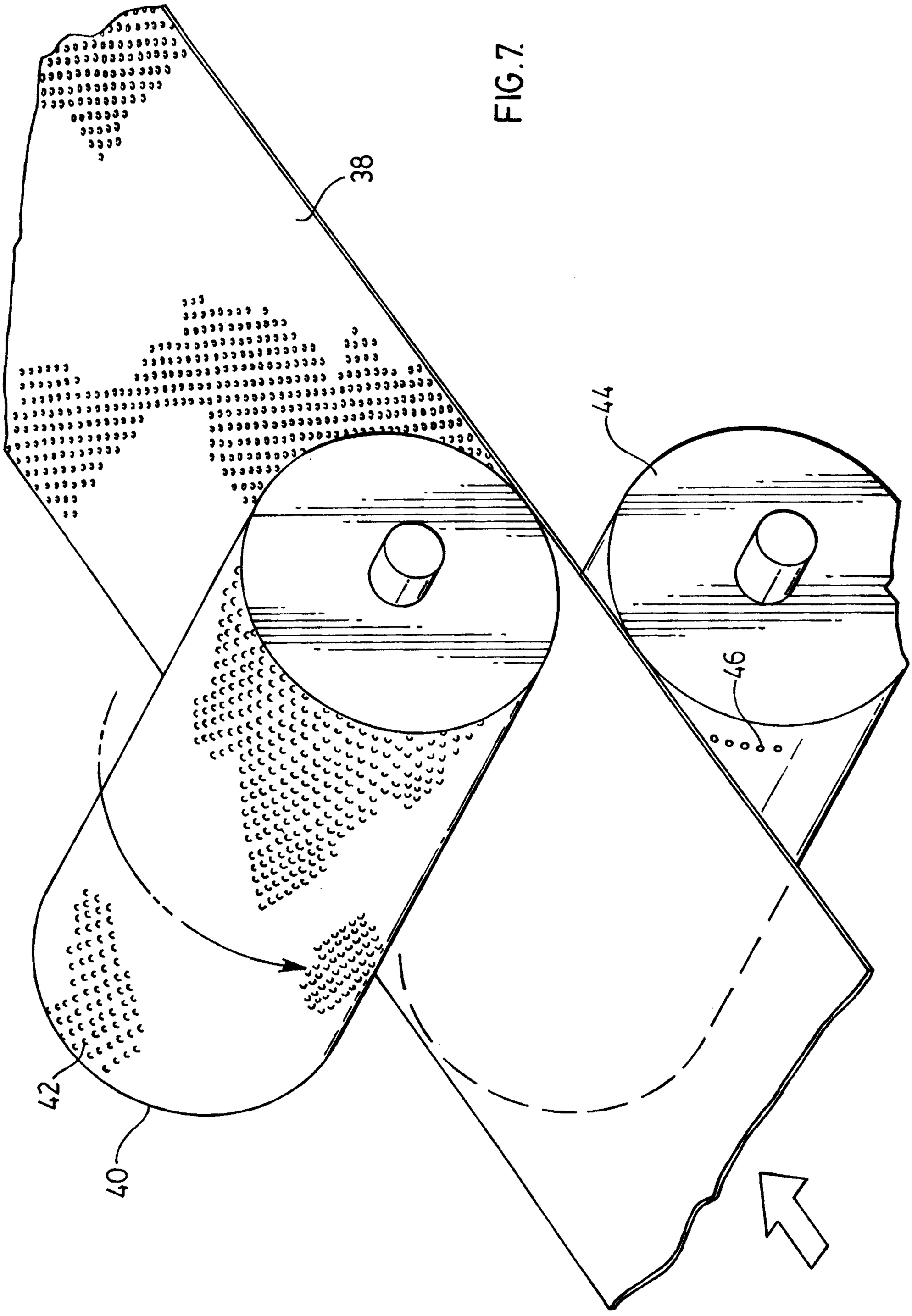


FIG.7.

FIG. 9.

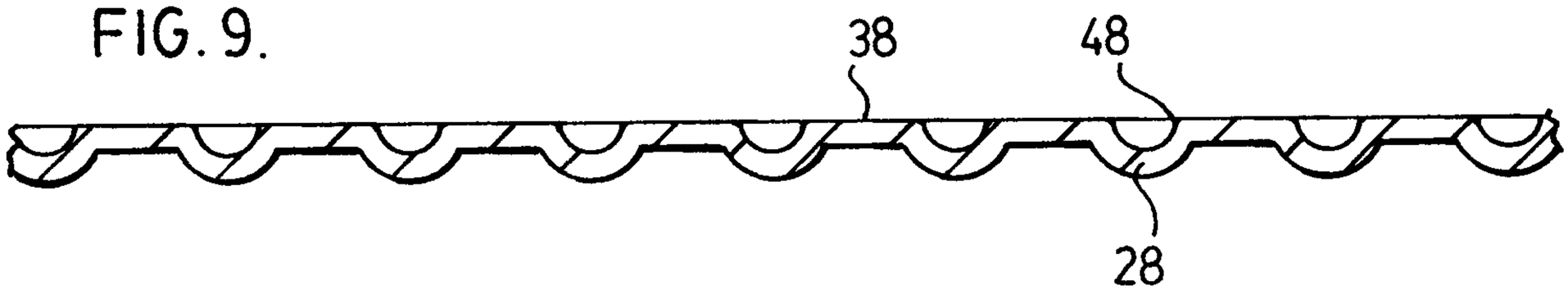


FIG. 8.

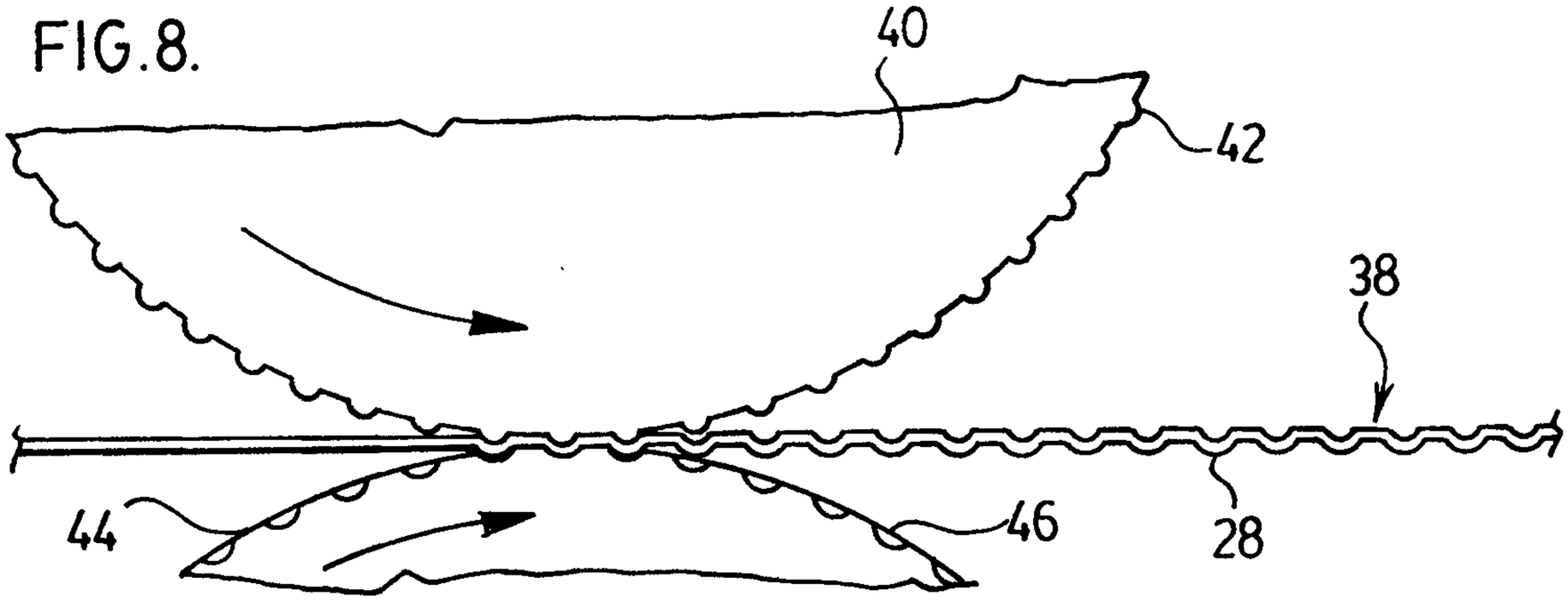
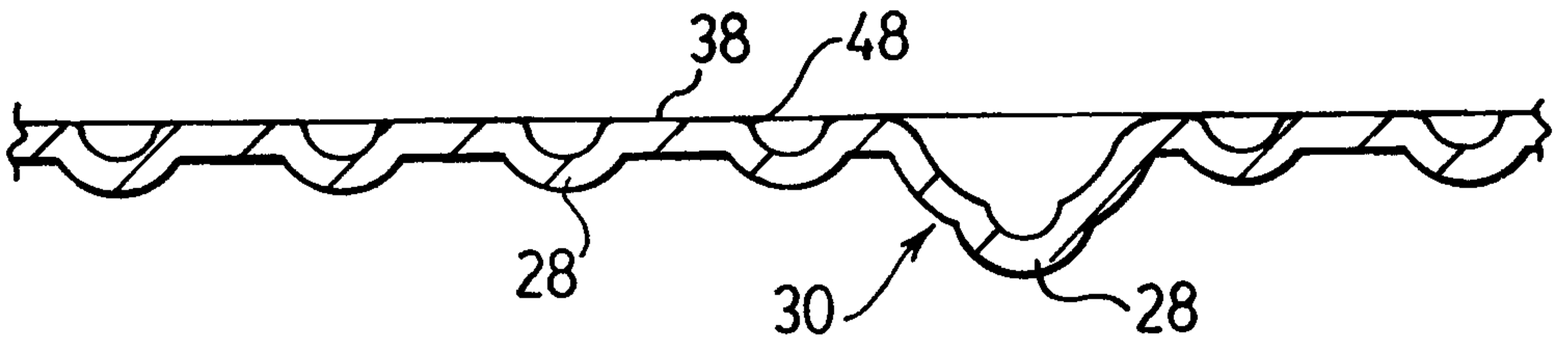


FIG. 12.



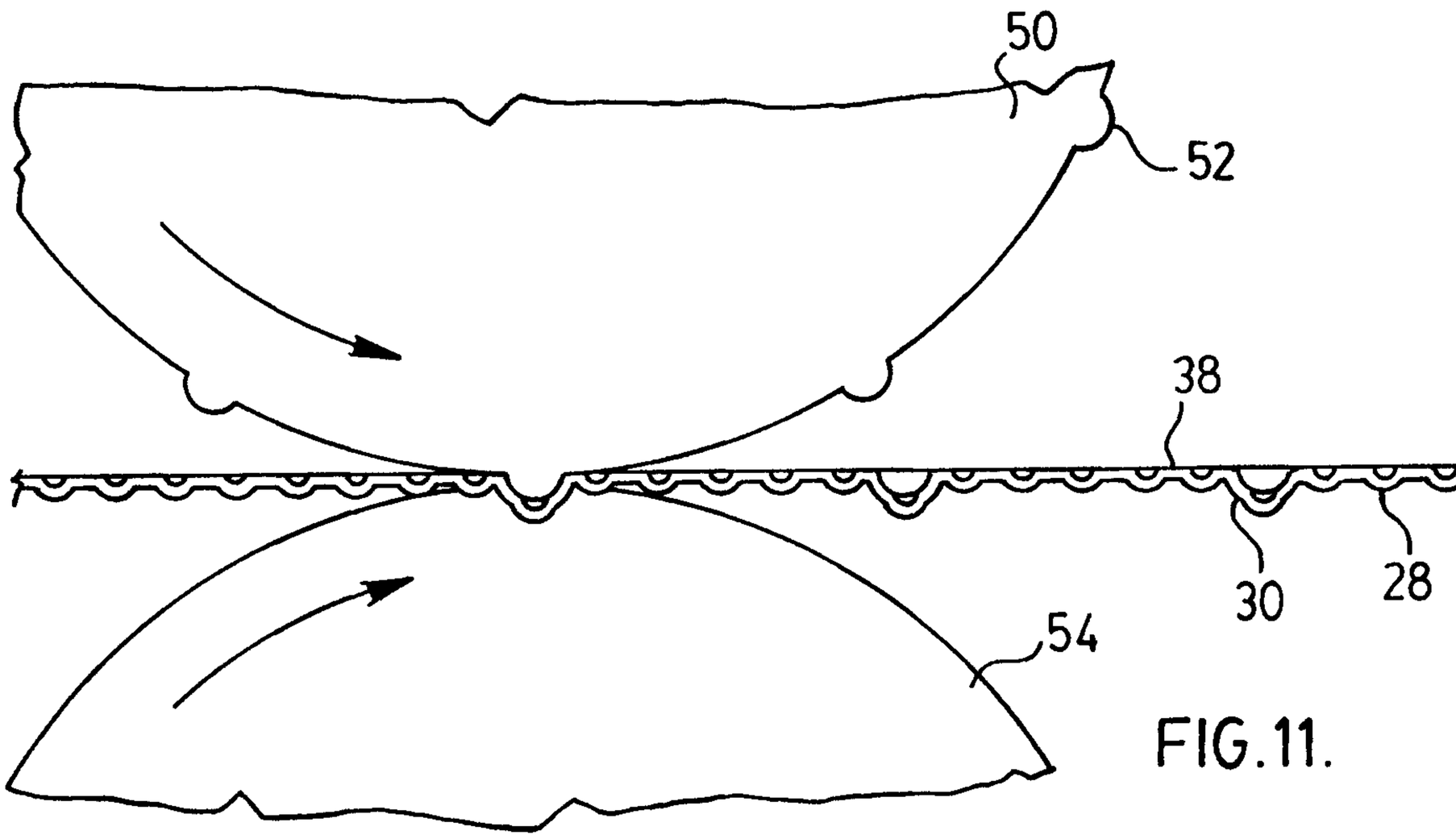


FIG. 11.

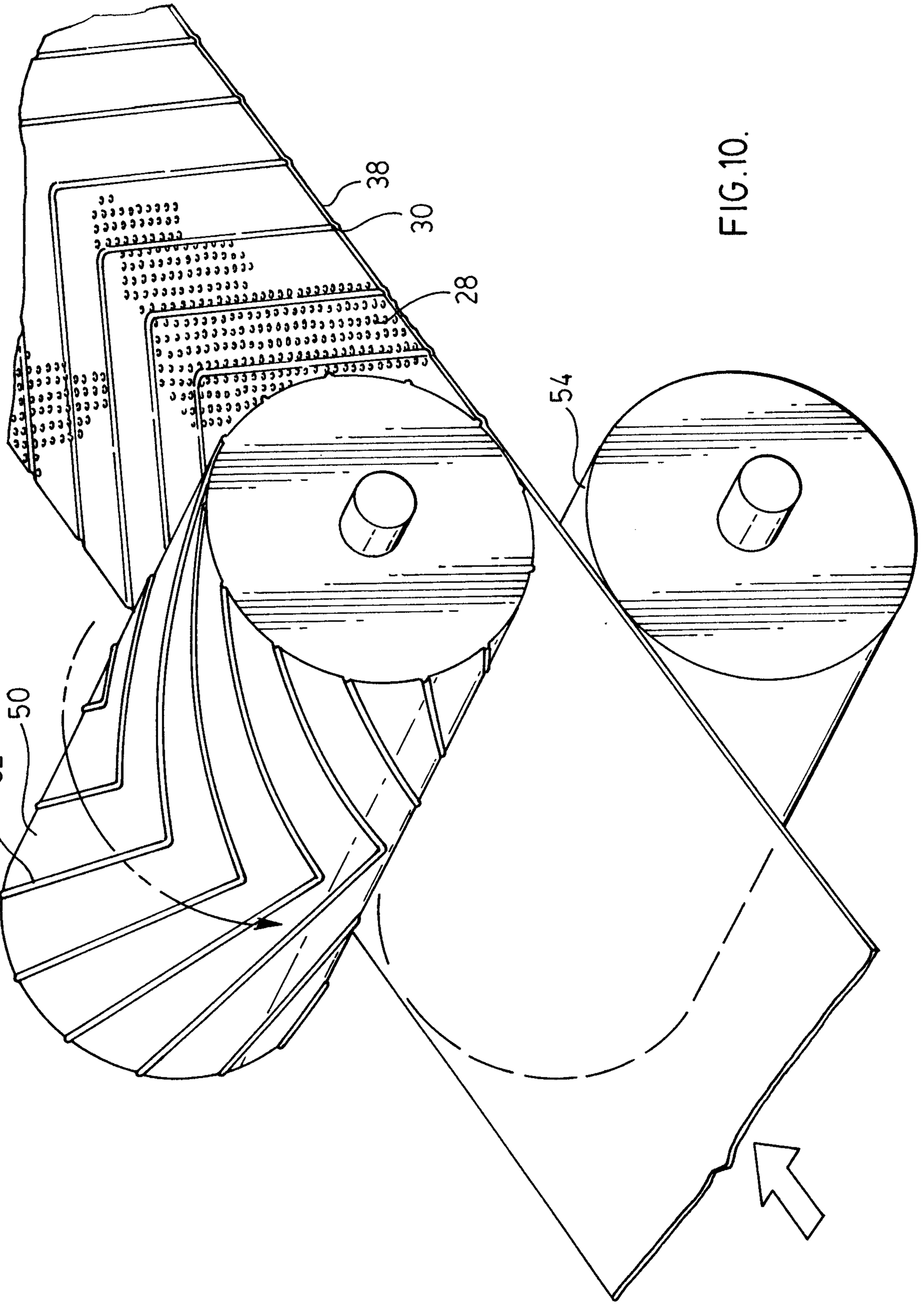


FIG.10.

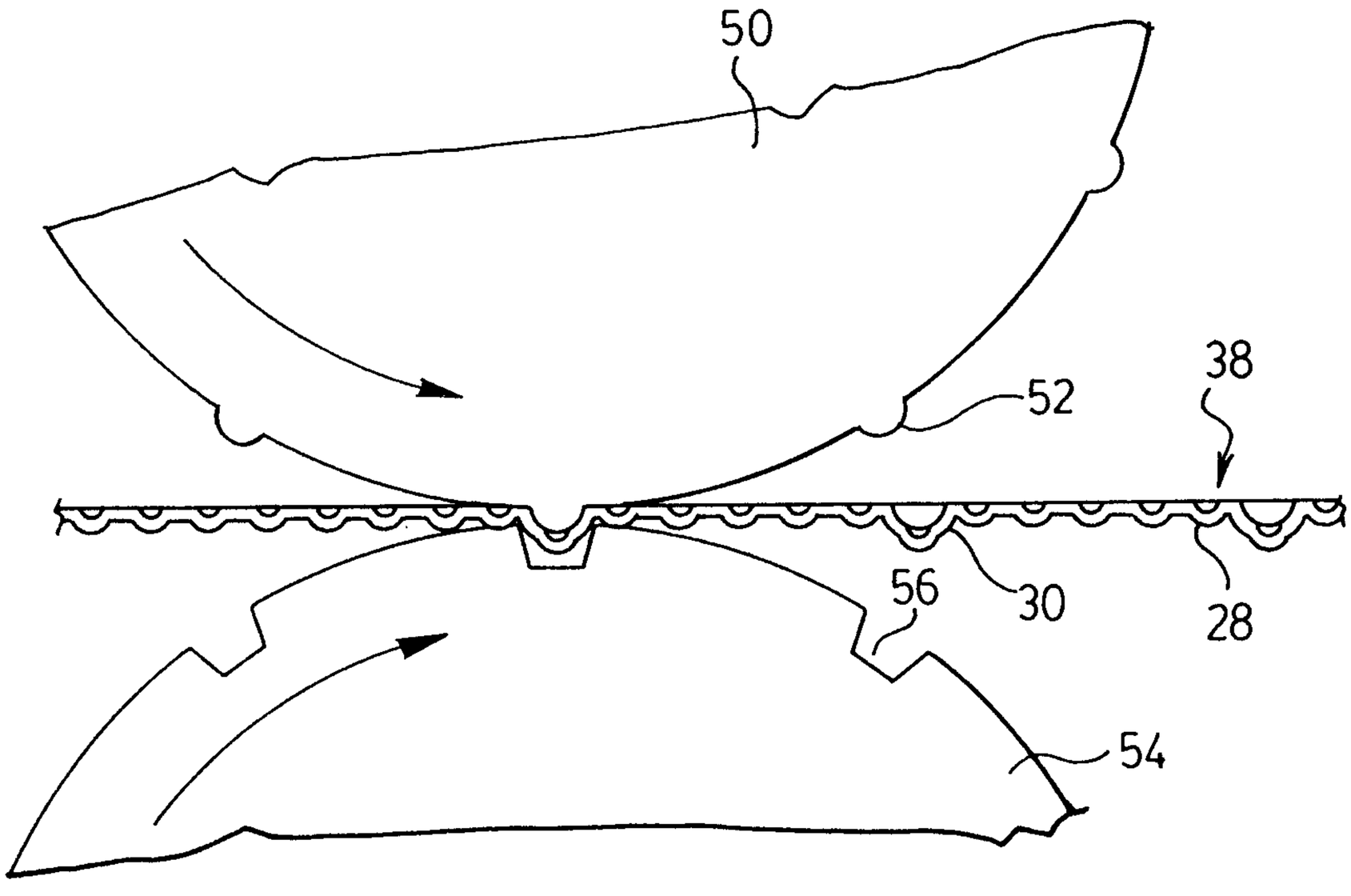
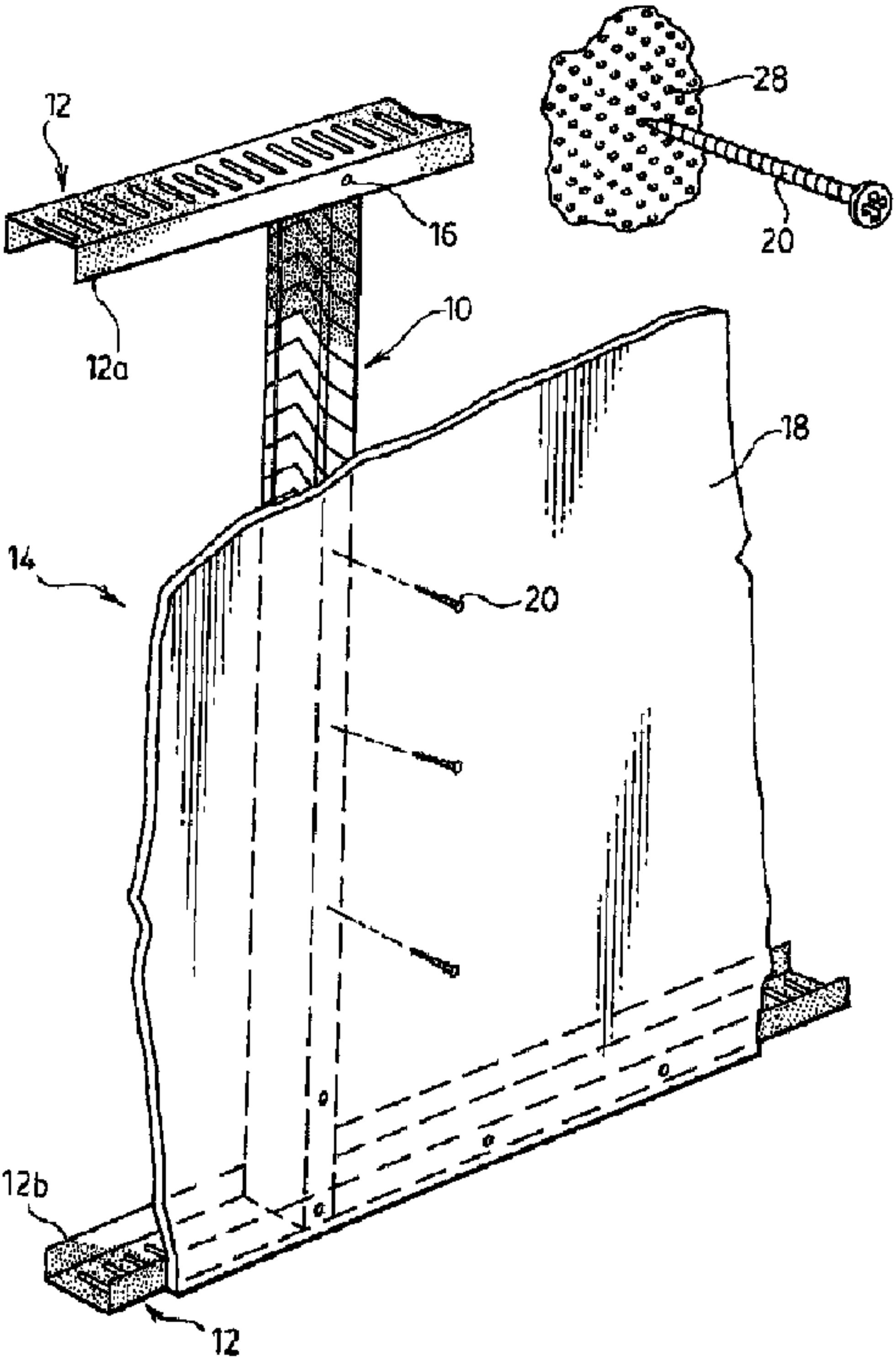


FIG. 13.


12
16
28
20
12a
10
18
14
20
12b
12