PATENTS EXAMINATION BOARD

Subject: The Drafting of Patent Specifications - Paper 1

Date: January 2023

Time: 09h00 - 13h00 (although candidates requiring extra time are entitled to an additional two hours)

Examiners: L Cilliers
V Williams

Moderator: J D Whittaker

Question 1

Your client hands you his attempt at providing a specific description and drawings of his new "predictor" mine prop for encouraging predictable compression of the prop in a stope area of an underground mine and asks that you add claims to cover his invention.

A mine prop in accordance with the invention will now be described by way of the following, non-limiting example with reference to the accompanying drawings.

In the drawings:

Figure 1 is a three-dimensional schematic showing a predictor mine prop in accordance with the present invention;

Figure 2 is an enlarged side view of a portion of the mine prop of Figure 1;

Figure 3 is a three-dimensional schematic showing only a timber portion of the mine prop of Figure 1;

Figure 4 is a top view of the timber portion shown in Figure 3;

Figure 5 is an enlarged side view of one end of the timber portion of the mine prop when viewed along the line 5-5 in Figure 4;

Figure 6 is an enlarged cross-sectional view of one end of the timber portion of the mine prop when viewed along the line 6-6 in Figure 4;

Figure 7 is another top view of the timber portion of the mine prop shown in Figure 3 in which the timber portion has been rotated 45 degrees relative to the timber portion illustrated in Figure 4;

Figure 8 is an enlarged side view of one end of the timber portion of the mine prop when viewed along the line 8-8 in Figure 7; and

Figure 9 is an enlarged cross-sectional view of one end of the timber portion of the mine prop when viewed along the line 9-9 in Figure 7.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figures 1 to 9 of the drawings, reference numeral 10 refers generally to a mine prop in accordance with the present invention.

The mine prop 10 includes a prestressing device 12 which is mountable coaxially on a timber pole 14. A plurality of rows of scallop shaped cuts 16 are provided in the timber pole 14 to facilitate predictable compression and yielding of the timber pole in a loaded or roof-supporting condition of the mine prop 10. As best illustrated in Figure 3 of the drawings, the depth of each of the cuts decreases from the cut 16.1, adjacent an end 18 of the pole 14, to the cut 16.5, remote from this end of the pole, and the end 18 of the pole 14 has a generally star- or X-shape.

The timber pole 14 is substantially cylindrical in shape and has a length which may be sized to correspond generally with the gap between a hanging wall or ceiling (not shown) and a footwall or floor (also not shown) of a passageway, tunnel or stope area in an underground mine. Typically, the timber pole 14 is manufactured from eucalyptus grandis or Rose gum and has a diameter in the region of 195mm. The cuts

16.1 to 16.5 may extend from the end 18 of the pole 14 for a distance of between 200mm and 600mm.

A disc shaped separator 20 is provided between each pair of adjacent cuts 16.1 to 16.5 and, as shown in Figure 2, the side wall 22 of each cut 16 is inclined at an acute angle relative to a central longitudinal axis 24 of the timber pole 14 so that the timber pole has a generally tapered appearance near the end 18.

It is to be appreciated that the depth of the cuts gradually decreases, and the cross-sectional area of the timber pole 14 therefore gradually increases, as these cuts extend further away from the end 18 of the timber pole 14. As the cross-sectional area of the timber pole 14 increases, the load which can be received also increases, and this facilitates controlled and predictable compression and yielding of the prop 10 in a roof-supporting condition as the hanging wall moves towards the footwall over time.

Notably, tapered fingers 26 on the timber pole 14 retain the maximum diameter of the timber pole despite the reduction in the cross-sectional area as the timber pole approaches the end 18. For example, Figure 8 illustrates how the maximum diameter of the timber pole 14 remains substantially constant along the length of this pole. In this way, the ends of the fingers 26 are sized to be engageable in a friction fit within a receiving formation (not shown) in an underside of a conventional prestressing device 12.

With reference now to Figures 1 and 2 of the drawings, the conventional prestressing device 12 includes an expansion chamber 28 and an inlet 30 for allowing pressurised fluid (not shown) into the expansion chamber. The pressurised fluid introduced into the expansion chamber 28 serves to expand this chamber, extending the dimension of the prestressing device 12 in a longitudinal direction, thereby prestressing the timber pole 14, typically to a load of between 15 tons and 25 tons, when the prop 10 is in a roof-supporting condition between a hanging wall (not shown)

and a footwall (not shown) in an underground mine. The prop 10 includes retaining wires 32 which circumscribe the timber pole 14, as shown, to resist radial expansion and splitting of the timber pole during loading. Carrying handles 34 (see Figure 1) are also provided to facilitate the carrying of the mine prop 10 by a miner.

It is, of course, to be appreciated that the mine prop in accordance with the invention is not limited to the precise constructional and functional details as hereinbefore described with reference to the accompanying drawings, and may be varied as desired.

The inventor believes that a mine prop in accordance with the present invention is advantageous in that the cuts 16 encourage predictable compression and yielding of the timber pole 14 when compared to a conventional "pipe stick" or timber pole having a uniform cross-sectional area along its length. Further, the arrangement of the cuts 16 and the fingers 26 allows the maximum outer diameter of the timber pole 14 to remain constant while the cross-sectional area decreases towards the end 18, and this permits engagement of the end 18 of the timber pole 14 within a conventional prestressing device.

The candidate is required to identify the inventive feature(s) of the invention, and to draft up to three claims to protect the above invention.

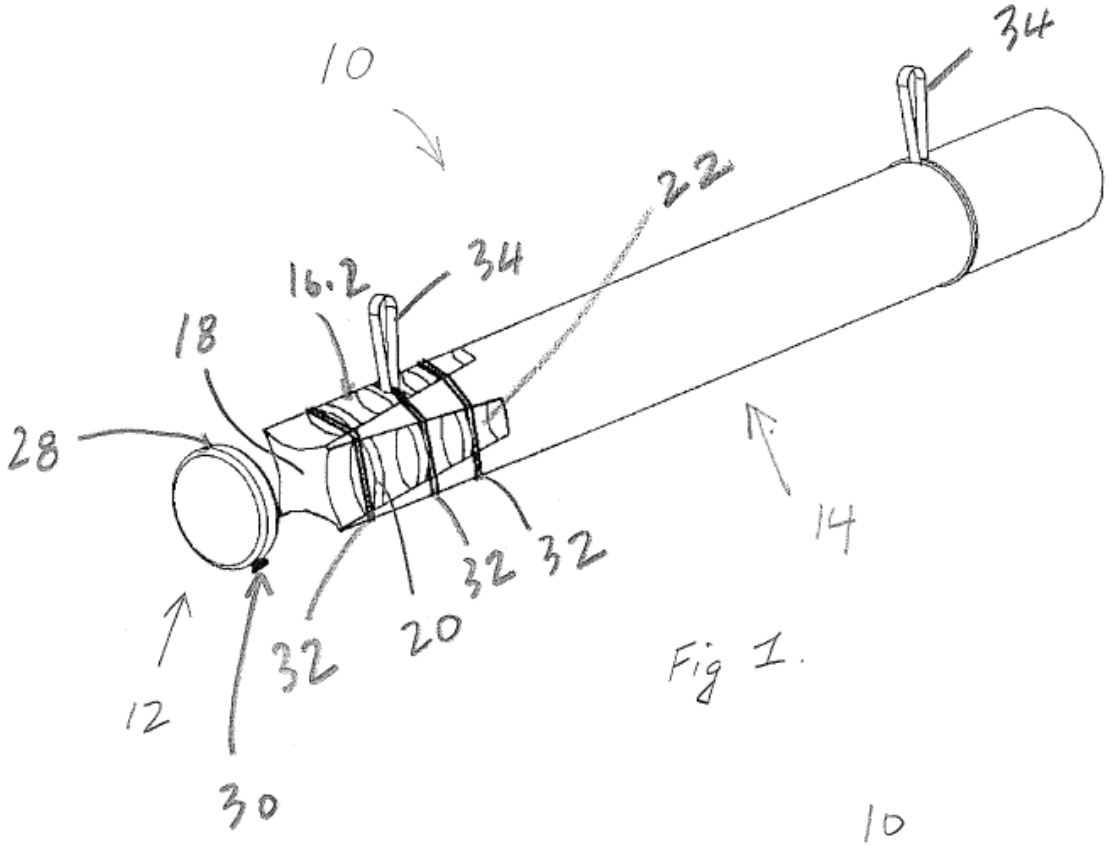
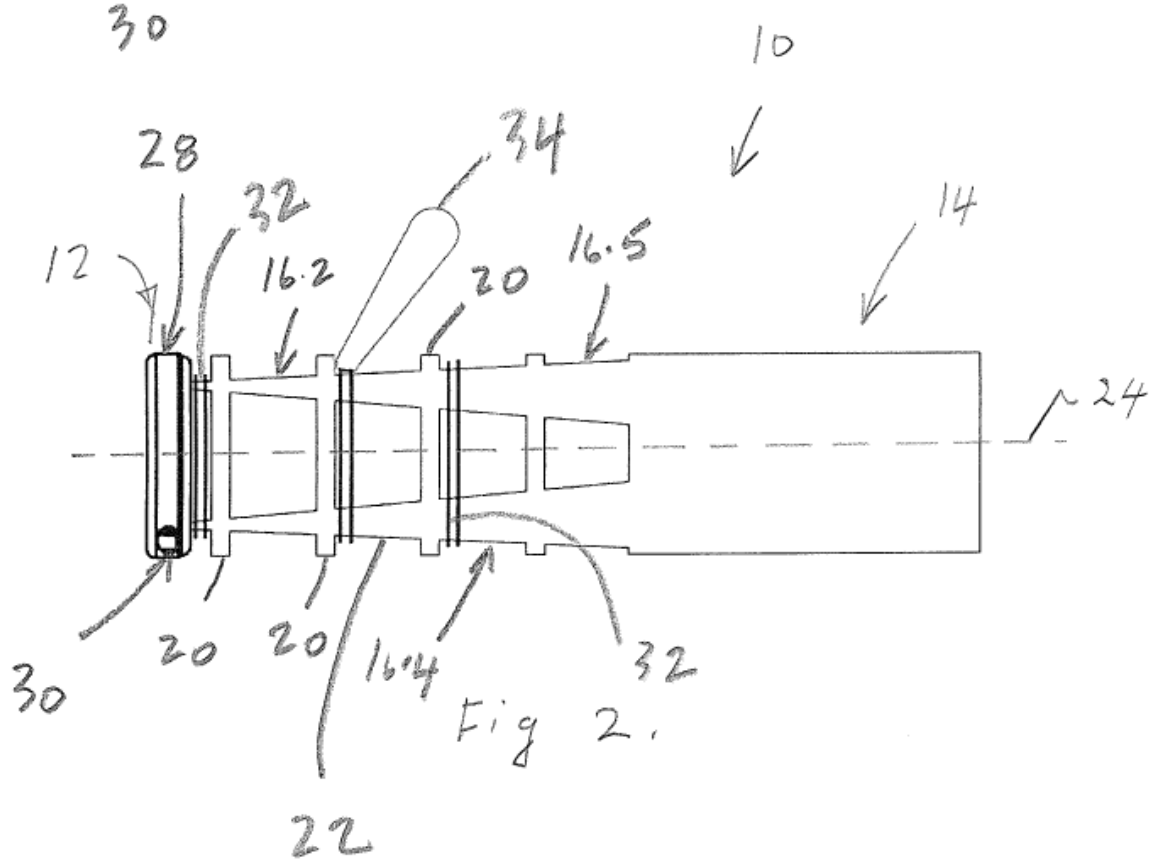

10
34
22
16.2
34
18
28
32
32
20
32
12
30
14

Fig 1.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28
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32
12
16.2
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16.5
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24
30
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16.4
32
22

Fig 2.

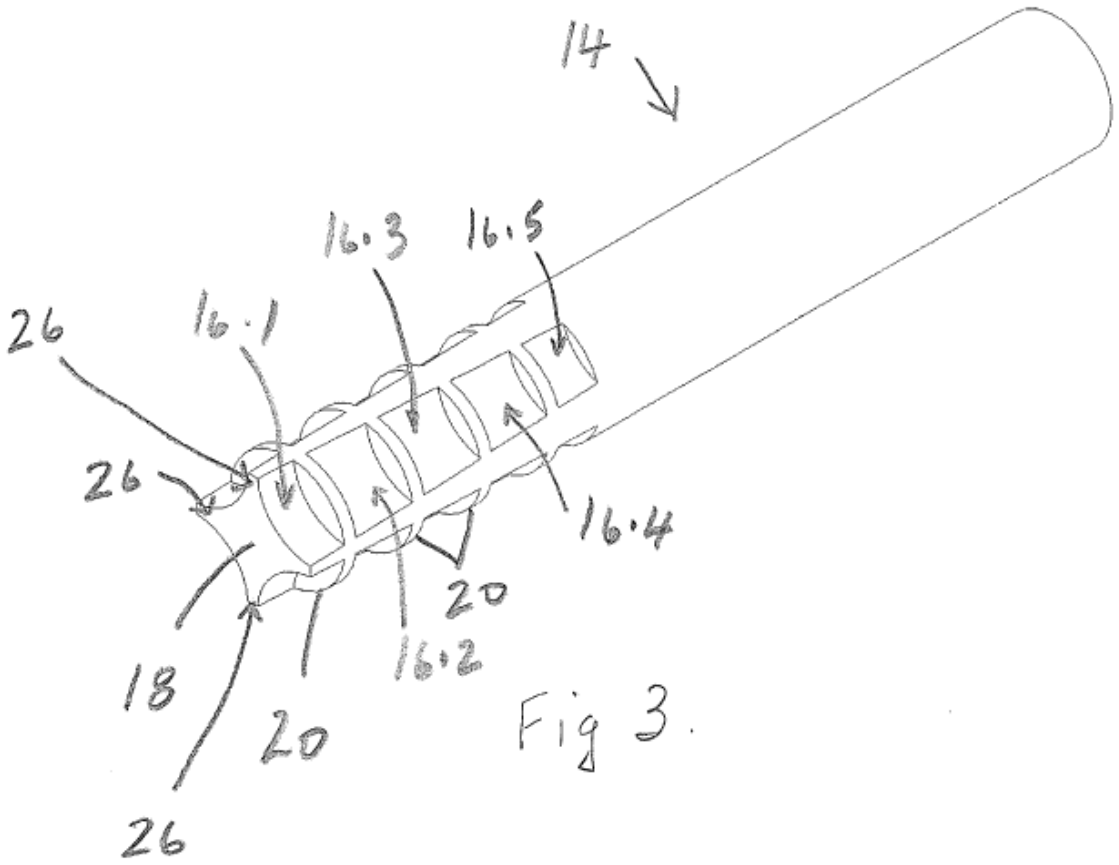


Fig 3.

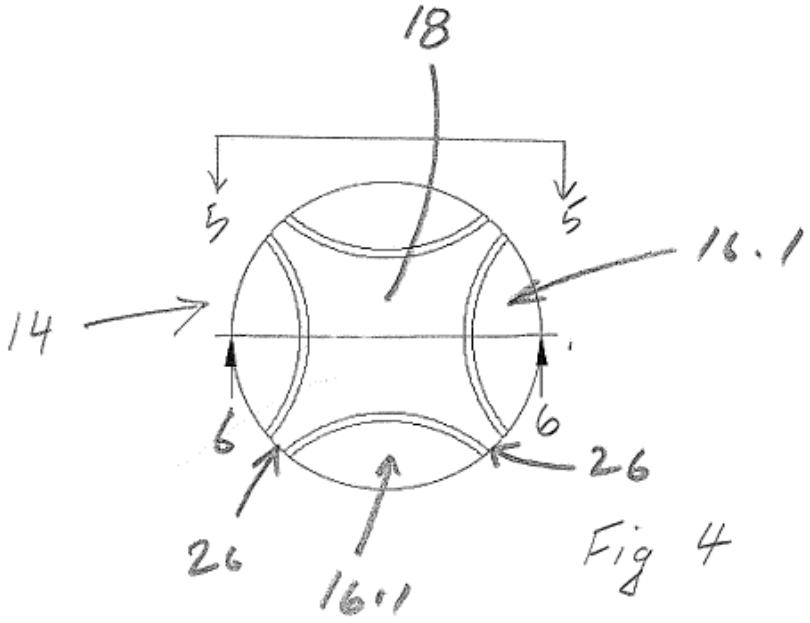

18
5
5
16.1
14
6
6
26
26
16.1

Fig 4

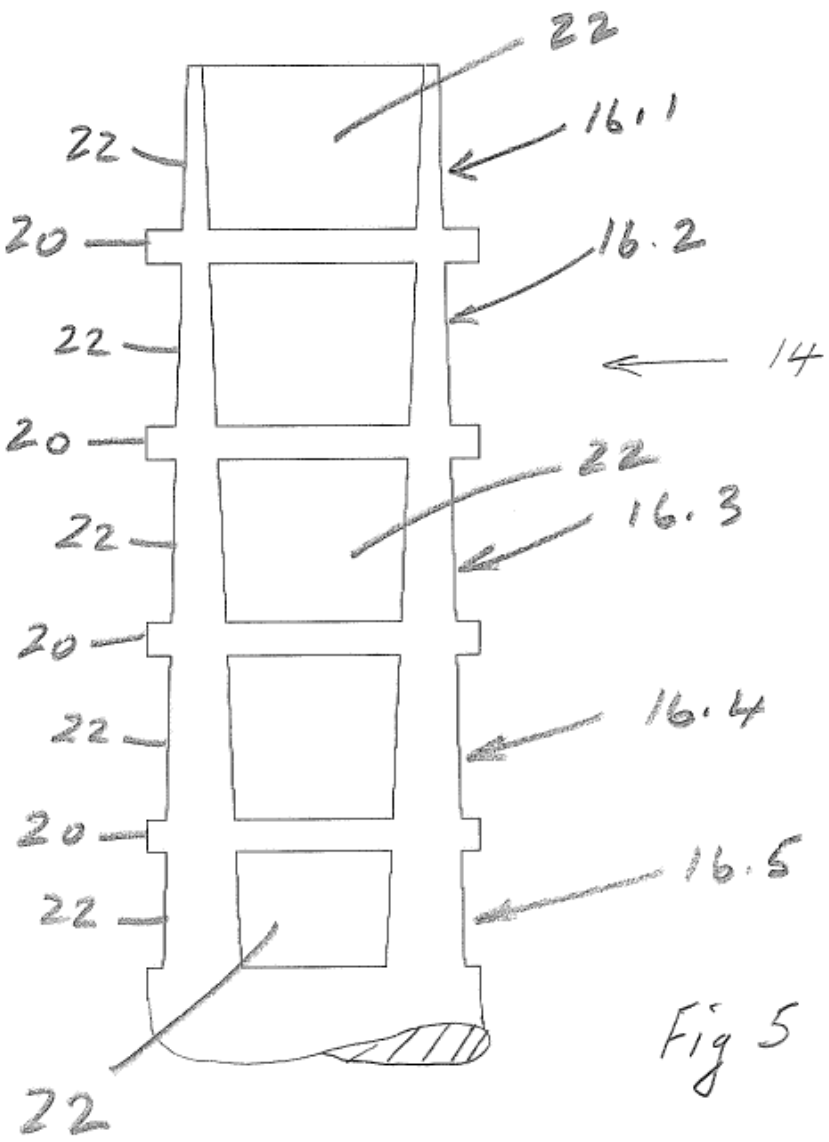

22
16.1
22
20
16.2
22
14
20
22
22
16.3
20
22
16.4
20
22
16.5
22

Fig 5

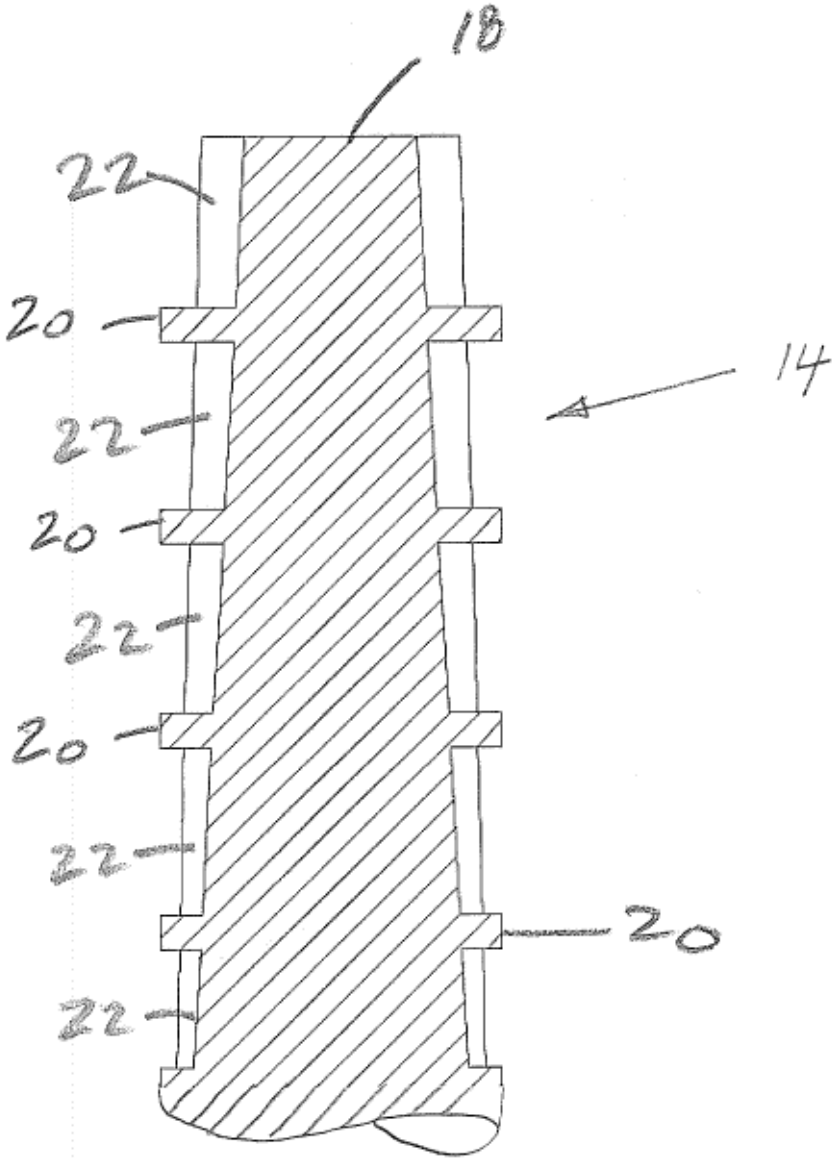


Fig 6

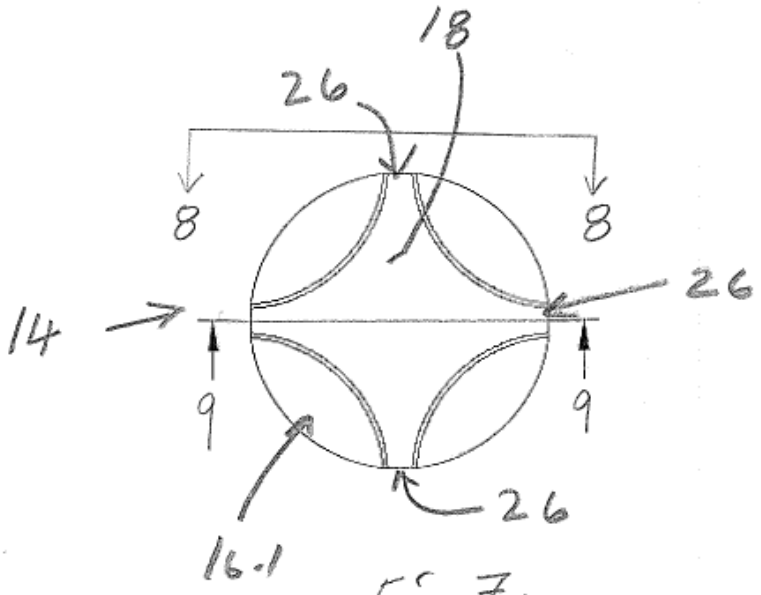


Fig 7.

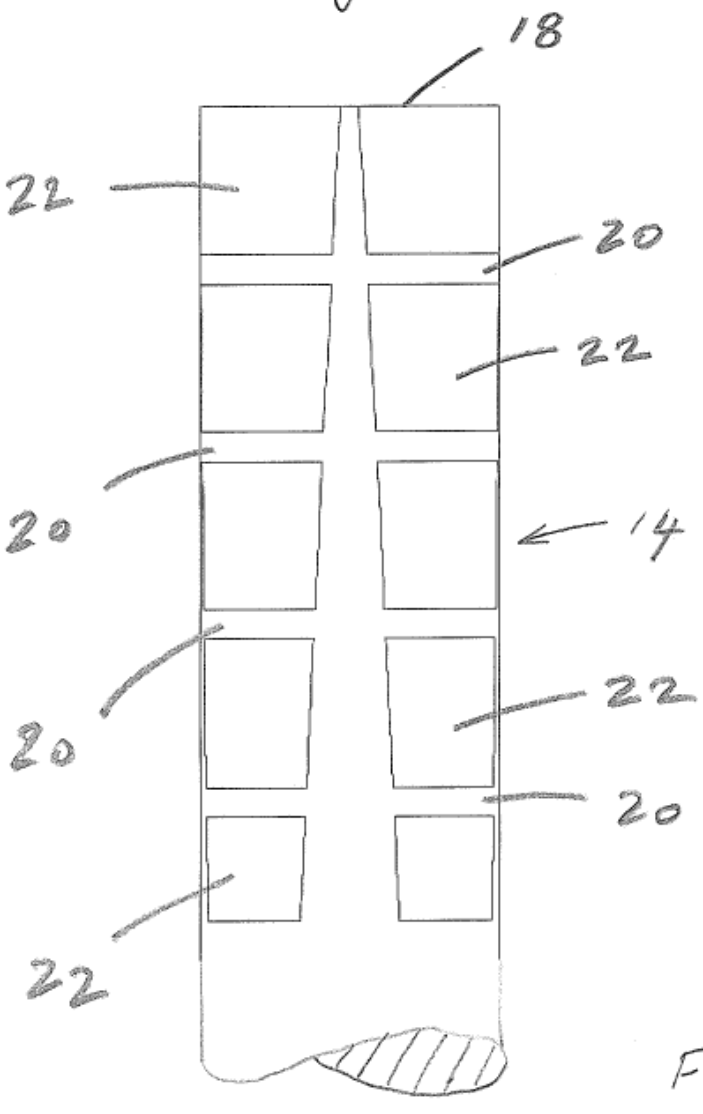


Fig 8

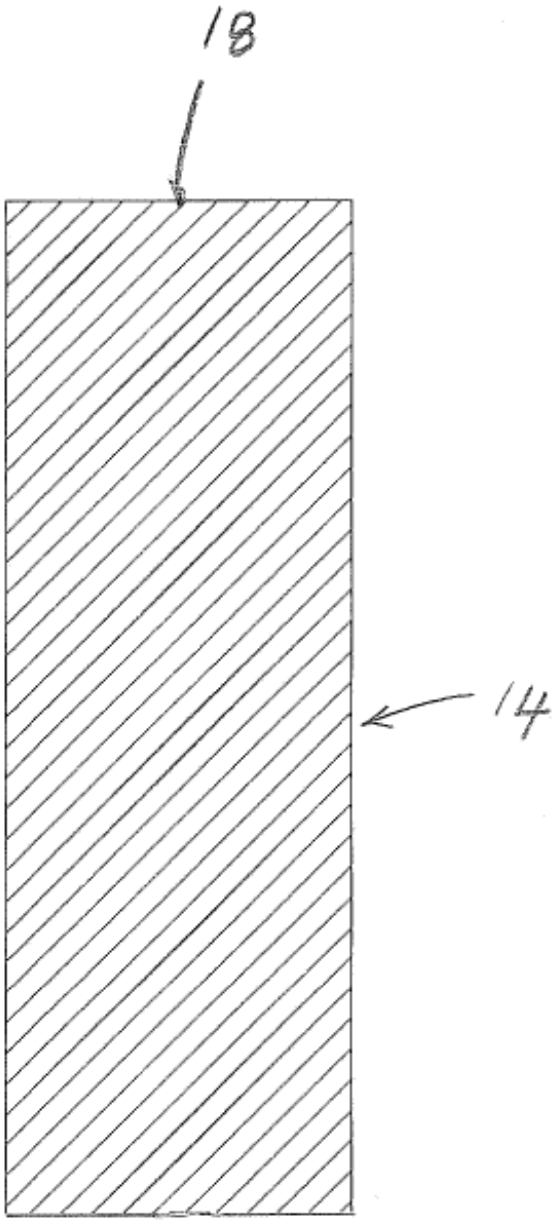


Fig 9

Question 2

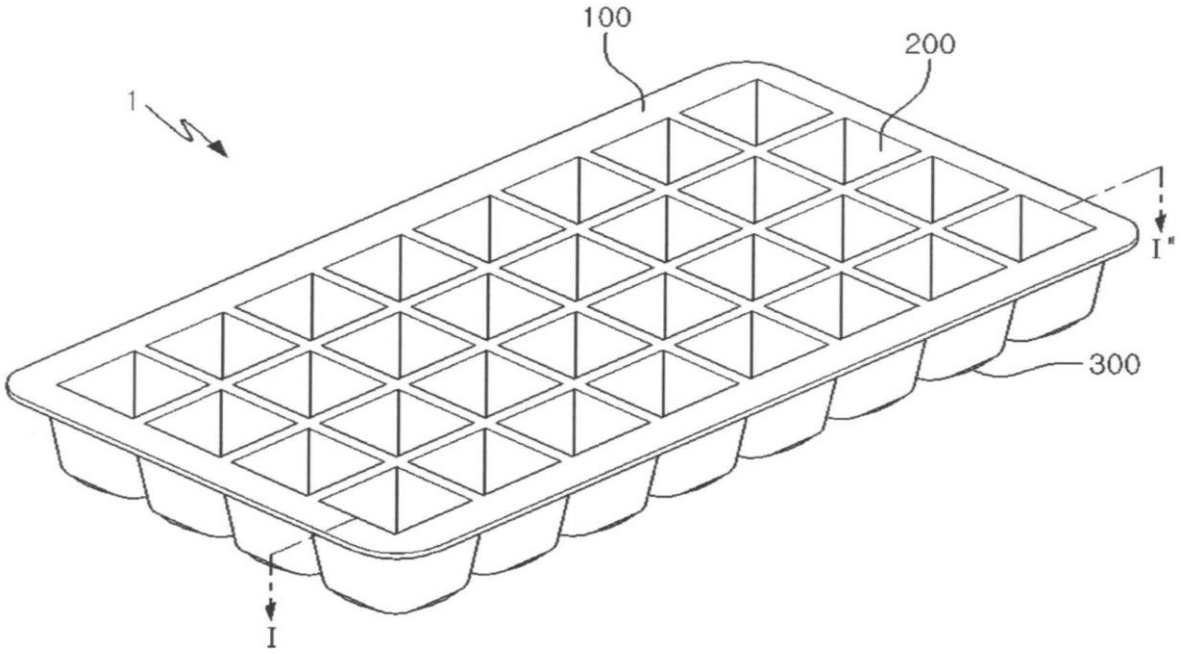
Your client hands you drawings (the accompanying Figures 1 to 5) of his new ice maker 10 which includes an integrally formed silicon ice tray 12 configured to be received in a conventional 2-litre ice cream container 14. The ice tray 12 has a base 16 and a plurality of walls 18 and 20 extending outwardly from either side of the base. The walls 18 extend transversely with respect of the walls 20 to define ice block forming zones 22. Slits 24 in these walls allow the tray 12 to bend in the directions of arrows A (see Figure 4) and arrows B (see Figure 5) to facilitate extraction of ice blocks from the zones 22. Each zone 22 has four corners 26 formed at intersections of the walls 18 and 20 (see, for example, Figures 1, 4 and 5 of the drawings), and the slits 24 are located on the walls 18 and 20 midway between the corners 26. Holes 28 in the base 16 allow water to pass from the zones 22 on one side of the base to the zones 22 on the other side of the base when the ice cream container 14 is filled with water. A lid 30 is provided to close the ice cream container 14 once it has been filled with water.

In use, the ice tray 12 is placed within the ice cream container 14 and this container is filled with water. The holes 28 in the base 16 allow water to flow through the base between the ice block forming zones 22 above and below the base. After filling, the lid 30 is placed on the container 14 to prevent water in the container from spilling when the icemaker 10 is placed in a freezer. Once the water has frozen, the ice tray 12 may be removed from the container 14. In this regard, the outer edges of the walls 18 and 20 are tapered to facilitate the removal of the tray 12 from the container 14. The ice tray 12 may then be bent manually in the directions of arrows A (see Figure 4) and arrows B (see Figure 5). As the ice tray 12 is bent in this way, the slits 24 are "opened", increasing the size of the ice block forming zones 22, thereby assisting in extracting multiple ice blocks from the zones 22.

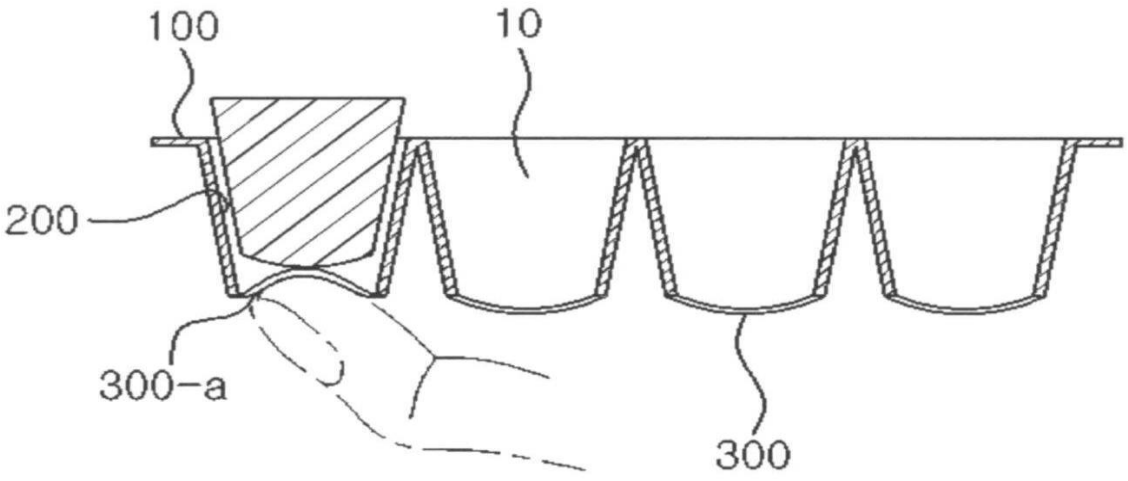
Your client then shows you a perspective view and a cross-sectional view of a prior art ice tray, i.e. a flexible silicone ice tray, and these views are included in the drawings below. With reference to these views of the prior art ice tray, your client tells you that a conventional ice tray 1 includes an upper member 100, which defines a generally rectangular outer border and a generally grid-shaped portion formed within the outer border, and a plurality of ice forming cubicles 10 depending from the upper member 100. Each cubicle 10 includes four side walls 200 and a flexible base 300. Your client goes on to explain that a problem with this conventional ice tray is that the base 300 of each cubicle 10 must be manually flexed into the cubicle from below (see the flexed base 300-a in the cross-sectional view of the prior art ice tray) in order to extract ice cubes from the ice tray. Although this is not problematic when a user requires only one or two

ice cubes at a time, it becomes somewhat difficult and time consuming to empty the ice tray when a greater number of ice cubes are required. Your client believes that the ease with which multiple ice blocks may be removed from the ice tray 12 of the invention is a huge step forward on the prior art ice tray. Not only does the ice tray 12 of the invention have a double layer of ice blocks (one above the base 16 and one below this base), but each time the ice tray 12 is bent in the directions of the arrows A and B in Figures 4 and 5 of the drawings, multiple ice blocks are released from the ice tray. This allows a large quantity of ice blocks to be easily removed when compared to the prior art ice tray. In addition, your client tells you that the lid 30 of his ice maker 10 has the advantage of reducing the likelihood of water spills during filling and placing of the ice maker in the freezer.

The candidate is required to identify the inventive feature(s) of the invention, and to draft up to three claims to protect the above invention.



Prior art flexible silicone ice tray



Section view of prior art showing individual demoulding of ice cubes from the flexible ice tray

FIGURE 1

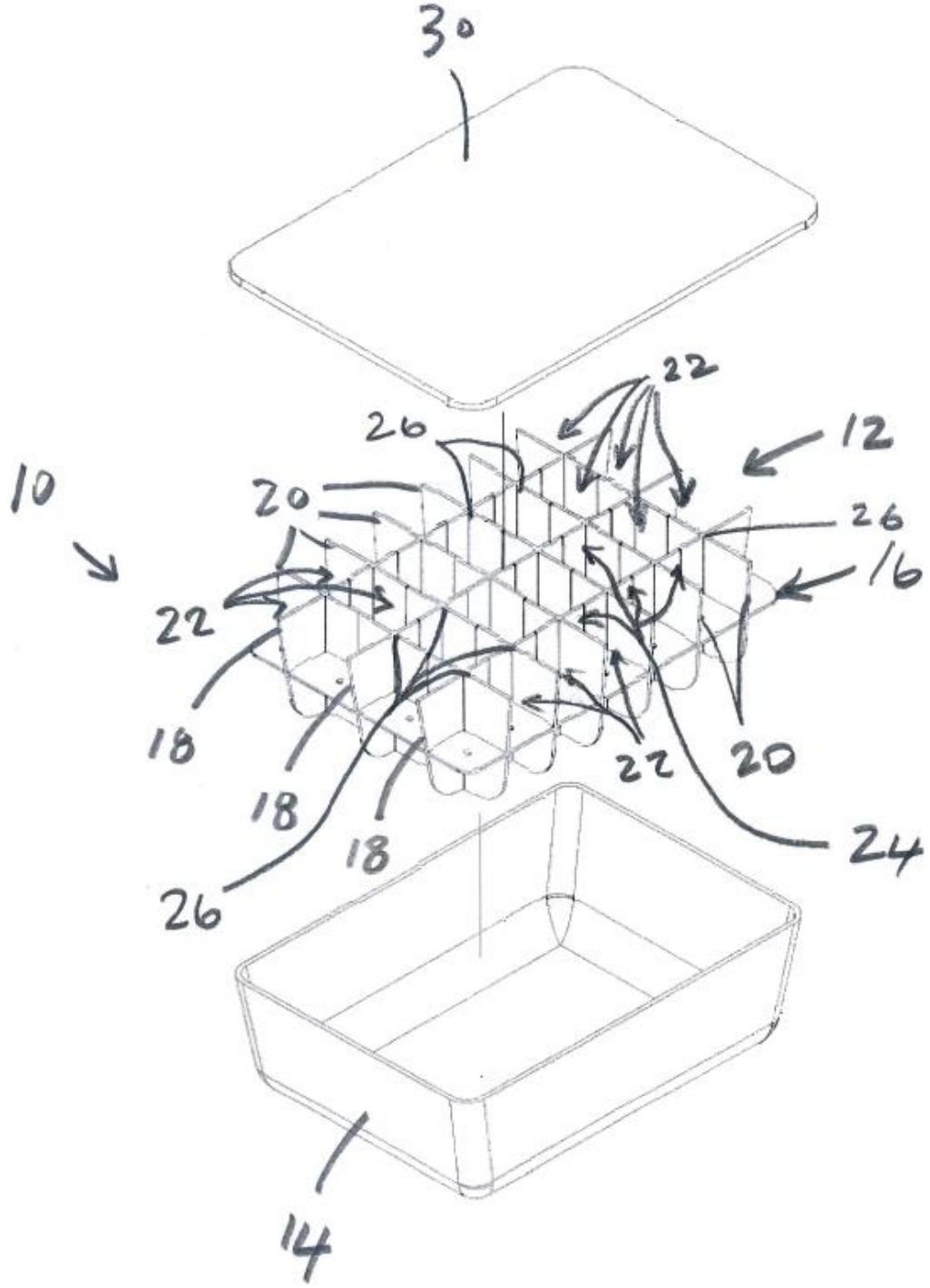


FIGURE 2

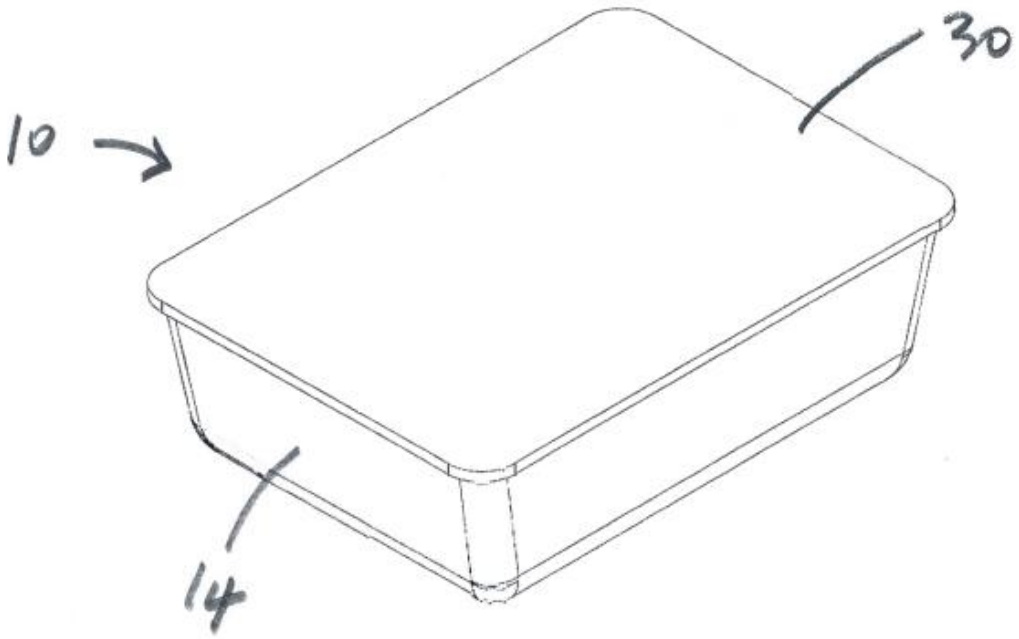


FIGURE 3

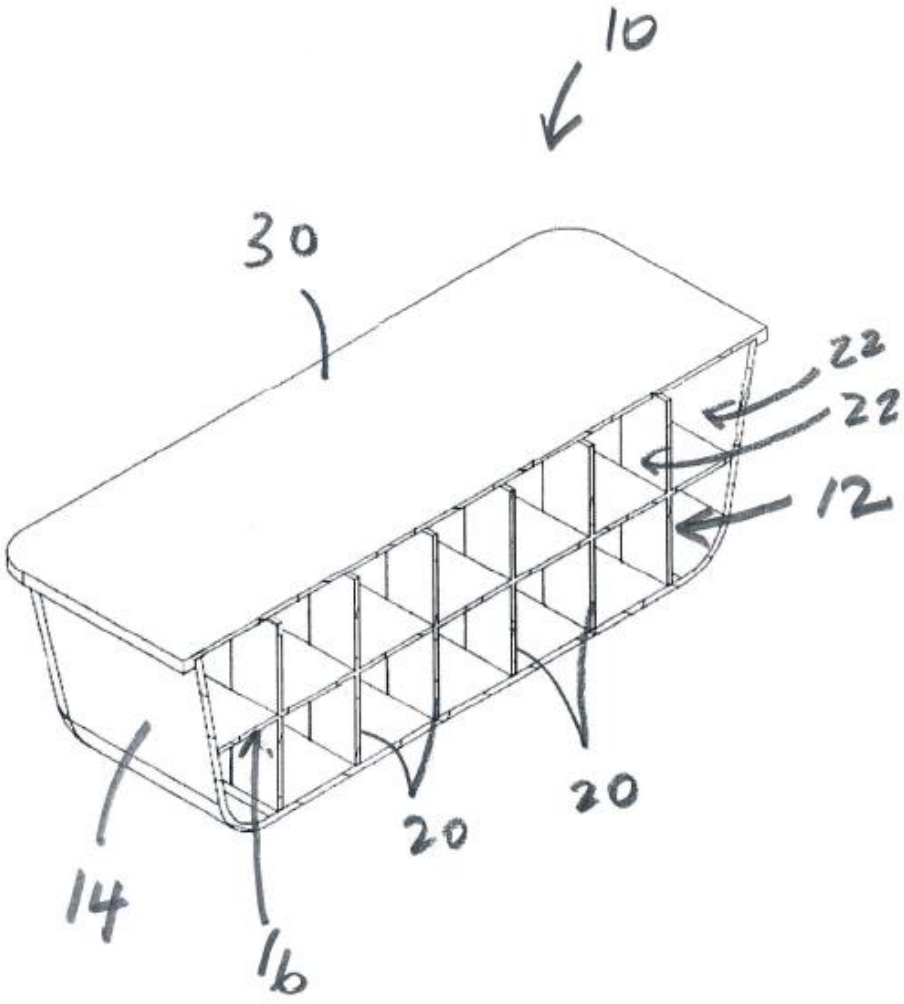


FIGURE 4

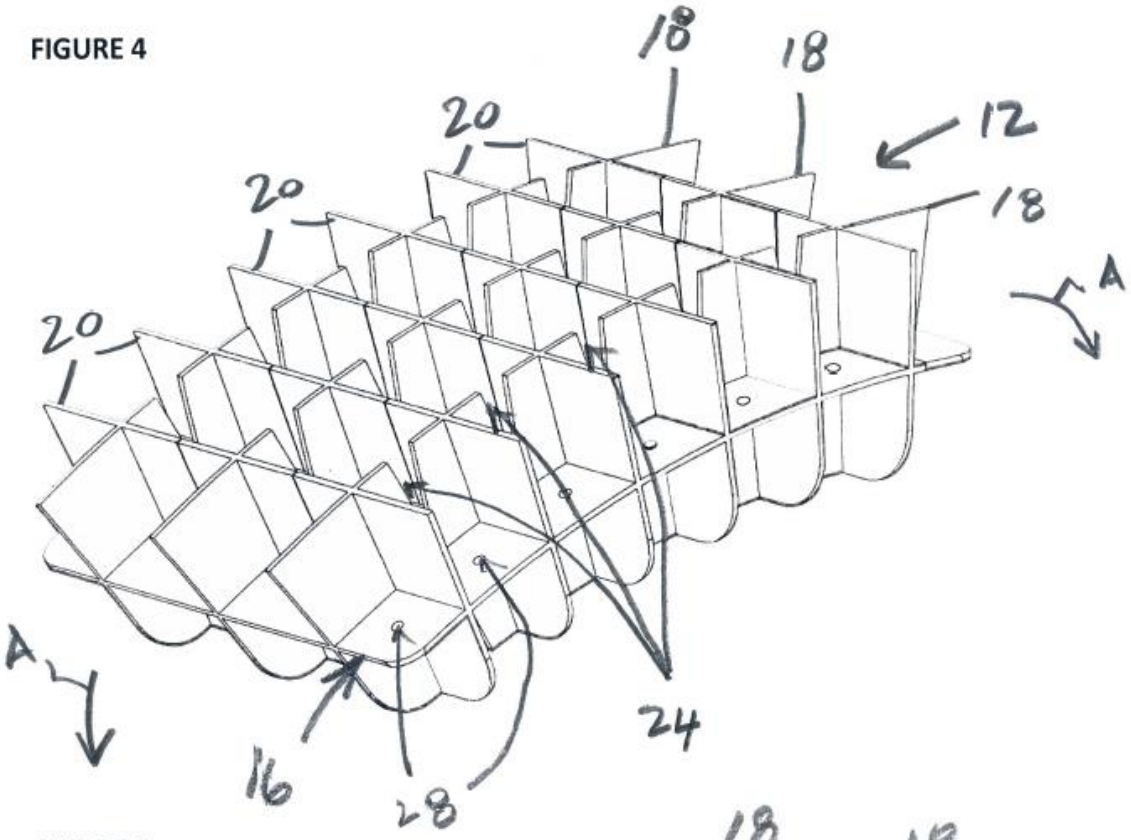


FIGURE 5