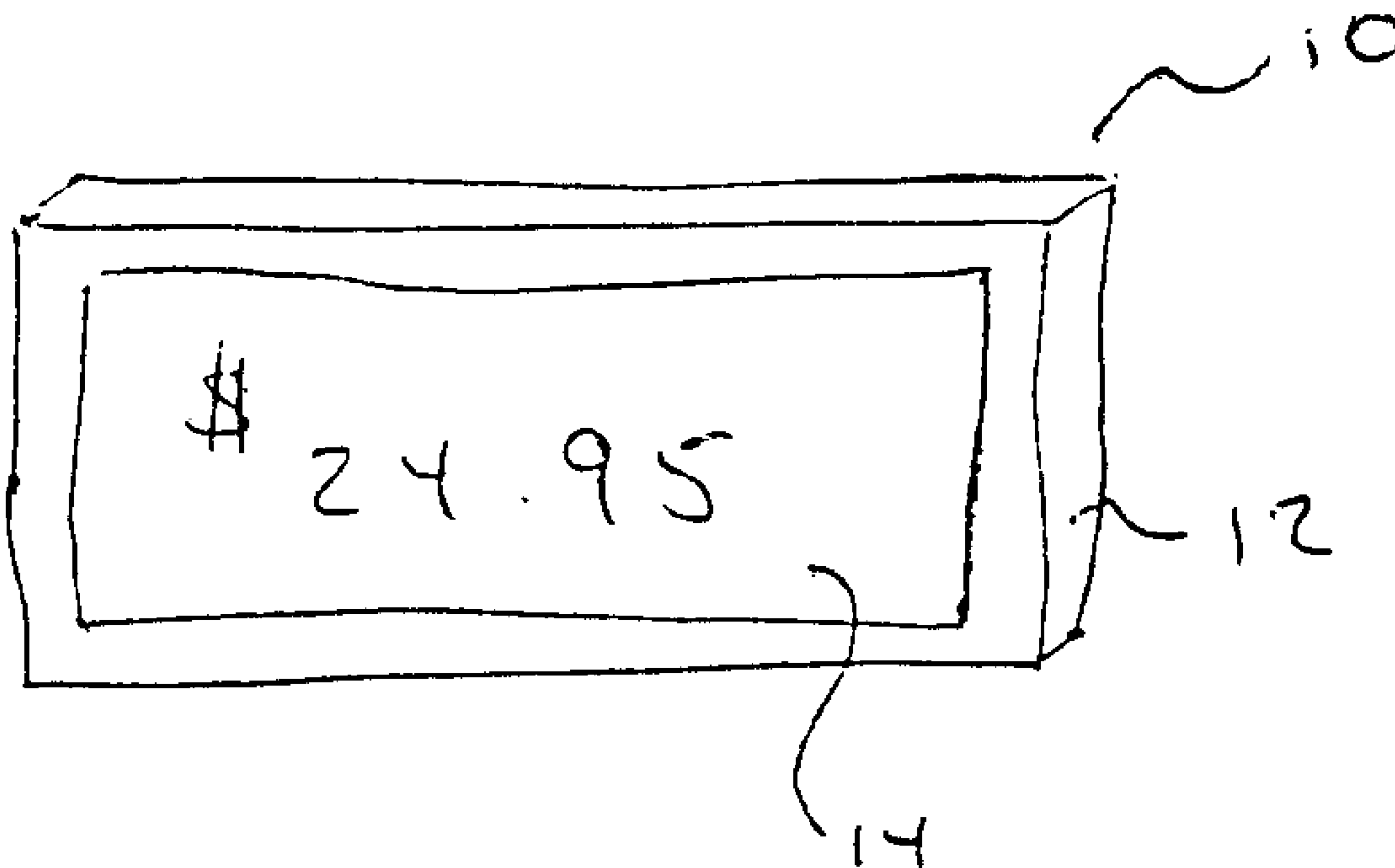




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(71) Demandeur/Applicant:  
OCTAGON VISUAL CORP., CA  
(72) Inventeurs/Inventors:  
COLOMBO, GERRY, CA;  
TATOR, ROBIN, CA  
(74) Agent: MARKS & CLERK

(54) Titre : DISPOSITIF D'AFFICHAGE ECLAIRE MONTE SUR TABLETTE  
(54) Title: SHELF MOUNTED LIGHTED DISPLAY DEVICE



(57) Abrégé/Abstract:

An illuminated shelf signage system is provided consisting of an opaque holder with a semi-transparent face plate. The face plate is illuminated by one or a plurality of light emitting diodes (LED's). The distance between the LED's and the face plate is controlled so as to minimize the visual appearance of point source lighting. Also, power consumption may be reduced by flashing of the LED's on a regular cycle. An improved, more visually appealing shelf sign is provided.

ABSTRACT OF THE DISCLOSURE

An illuminated shelf signage system is provided consisting of an opaque holder with a semi-transparent face plate. The face plate is illuminated by one or a plurality of light emitting diodes (LED's). The distance between the LED's and the face plate is controlled so  
5 as to minimize the visual appearance of point source lighting. Also, power consumption may be reduced by flashing of the LED's on a regular cycle. An improved, more visually appealing shelf sign is provided.

## SHELF MOUNTED LIGHTED DISPLAY DEVICE

### Field of the Invention

The present invention relates to a device for providing illuminated shelf signage, and  
5 in particular, to the use of shelf signage illuminated by light emitting diodes (LED) .

### Background of the Invention

Increasing, as bar codes are used primarily for pricing information at a cash register,  
the need for individual pricing of commercial or retail products is becoming unnecessary.  
As this occurs, the information provided on the store shelf is becoming increasing important  
10 in order that the consumer is provided with information, such as pricing, in order to  
determine whether to purchase a product.

Shelf signage has been known for many years. Typically, the signage is  
approximately an inch or so (2.5cm) in width, and can vary from approximately an inch in  
length, to lengths of up to, for example 8 to 10 inches. Shelf signage has evolved from  
15 printed or hand-written labels affixed to the shelf, to LCD (liquid crystal display) devices.  
These LCD devices can be programable to display a variety of information but are primarily  
used to display only the price of the product. The LCD devices are releasably attached to the  
shelf so that they can be easily removed for re-programming or replacement when prices  
change, the battery dies, or when the product is re-located within the store and/or shelf.

20 These devices might also be re-programmable by wireless remote systems such as  
that described in US Patent No. 6,256,034 (Olsson et al.), issued July 3, 2001.

A major disadvantage of these LCD devices, and LCD devices in general, is that the display is essentially limited to a system of black lettering on a gray-green background. Thus, there is little visual appeal to the consumer, in order to attract attention to the product.

For larger signs, other illumination systems are also possible. This includes back-lit signage wherein, for example, a series of fluorescent lights are located behind a semi-transparent panel so as to provide a lighted display. The semi-transparent panel can be coloured so as to provided a colourful display. However, as the fluorescent bulbs become old, or begin to fail, it becomes obvious that the lighted panel is not evenly illuminated. Also, unless the semi-transparent panel provides some diffusion of light, it is possible to see the “point sources” of light behind the panel which detracts from the visual appeal of the back-lit sign.

Other signage can be illuminated by edge-lit techniques such as that described in US Patent No. 6,275,339 (Chazallet et al.), issued August 14, 2001. While these devices can provide clear, illuminated signs, they are impractical for use in the small signage typically used in shelf signage application.

Given that there may be numerous signs in a retail establishment, it is also desirable to provide an illuminated signage system wherein the power consumption of each sign is minimized in order to reduce battery, or other electrical power use.

A particularly efficient and small illumination source is an LED (light emitting diode) device. These devices provide a small, bright light source, but in a shelf signage application, the LED’s would act as small point-sources of light, and it can be difficult to provide an acceptable, diffusely lighted appearance to the display.

### Summary of the Invention

Accordingly, it is a principal object of the present invention to provide an illuminated shelf signage system which allows for displays which are more visually appealing than the prior art LCD displays.

It is a further object of the present invention to provide an illuminated shelf signage system which avoids the problems associated with “point-source” lighting methods.



It is a still further object of the present invention to provide an illuminated shelf signage system which provides for low power consumption, while providing a visually appealing display.

5 These and other objects are attained by providing a shelf signage system which is illuminated by one or a plurality of LED light sources, which light sources are optionally operatively connected to one or a plurality of fibre optic cables, a semi-transparent face plate which is capable of diffusing the light from the light source, in order to provide the appearance of a diffuse light source when said face plate is positioned at a distance from said LED light sources to avoid the appearance of a point-source light.

10 Accordingly, the present invention provides a shelf signage system comprising a sign holder, a semi-transparent face plate on the front of said sign holder, at least one LED light source, and optionally at least one fibre optic cable for transmission of the light generated from said LED light source to the rear of said semi-transparent face plate, wherein said face plate is capable of diffusing light from the light source, and is positioned  
15 at a distance from said light source in order to avoid the appearance of a point-source light.

In a further aspect, the present invention also provides for a method of shelf signage illumination comprising placement of a shelf signage system as described herein, on the edge of a commercial or retail shelving unit.

#### Brief Description of the Drawings

20 Various embodiments of the shelf signage system of the present invention will now be described by reference to the following drawings wherein:

Fig. 1 is a perspective view of an illuminated sign according to the present invention;

Fig. 2 is a top, cross-sectional view of an illuminated sign;

25 Fig. 3 is a top, cross-sectional view of an alternative design of an illuminated sign in accordance with the present invention;

Fig. 4 is a front view of the back surface of the holder for the illuminated sign shown in Figure 2; and

Fig. 5 is a top, cross-sectional view of a still further alternative illuminated sign, according to the present invention.

#### Detailed Description of the Preferred Embodiments

Other features of the present invention, as well as other objects and advantages attendant thereto, are set forth in the following description and the accompanying drawings in which like reference numerals depict like elements.

In Fig. 1, an illuminated sign 10 is shown consisting of a holder 12 and a semi-transparent face plate 14. Holder 12 is preferably opaque to avoid the loss, or the unwanted emission of light, from the side or back of the illuminated sign, although, in some embodiments, the holder could be semi-transparent or transparent if desired. Holder 12 may be made of any suitable material, but is preferably made of either an extruded plastic or an injected molded plastic.

Holder 12 would generally have a width of approximately one inch (2.5 cm) and would be suitable for attachment to a shelf in such a manner that it would not interfere with removal of product from the shelf. While the sign shown in Figure 1 is rectangular, various shapes such as square, oval, circular or irregular shapes might also be used.

The various attachment means to attach the sign to the shelf are known to those skilled in this art, and are not shown in the drawing. However, it is preferred that the attachment means be such that easy removal and/or replacement of the sign would be possible. The holder may, however, also be attached to the shelf using a mechanical fastener or an adhesive fastener, or may be designed so as to fit into a "pricing channel" typically present on the front edge of commercial or retail shelving units.

The holder may be any suitable length depending on the sign to be displayed, but typically would be from 1 to 8 inches.

The semi-transparent face plate 14 is made of a material which acts to diffuse the light from the light source in the illuminated sign. Depending on the configuration of the signage system, the amount of diffusion needed is not always that great. However, there should be sufficient visual diffusion apparent to the viewer. A preferred material for face



plate 14 is a plastic material, such as, for example, styrene, although any other suitable material might be used. The face plate 14 can be printed and/or coloured in order to provide an desired visual appearance, when illuminated. The resultant "display" on said face plate can be created by a variety of methods known to those skilled in the art, but a preferred route is by lithography.

The face plate may also be simply a lens positioned in front of the light source in order to provide a lighted appearance.

Holder 12 is preferably adapted to allow for easy replacement of semi-transparent face plate 14, which can be achieved, for example, by providing a slot (not shown) in holder 12 which would allow for the insertion and removal of face plate 14.

In Fig. 2, a top, cross-sectional view of the illuminated sign 10 shown in Figure 1 is shown. Holder 12 is shown, as well as face plate 14, which has been inserted into holder 12 through slot 13. Inside of holder 12 is a battery 17 which is operatively connected to three LED's 18 through circuit board 15. However, direct wiring of LED's 18 to battery 17 is also possible.

The distance between LED's 18 and face plate 14 is important in order to avoid the appearance of a point-source light appearance. However, the distance selected will vary depending on the number of LED's placed in the holder, and the distance between the LED's. Further, the diffusion ability of face plate 14 can also assist in reducing the distance required between the LED's and face plate 14.

A larger number of LED's for a given surface area of the face plate, will typically reduce the distance between the LED's and the face plate. However, an increased number of LED's will result in an increase in power consumption. Accordingly, the selected number of LED's selected, and the distance between the LED's and the face plate will vary depending on the design of the signage system.

Illuminated signs of the present invention, according to the embodiment shown in Figure 2, might contain only 1 LED, but could contain additional LED's depending on the size of the sign, and the amount of light needed. Accordingly, the illuminated sign might contain a plurality of LED's. Typically, the number of LED's would range from 2 to 20, but

more preferably would range from 3 to 10.

In the embodiment shown in Figure 2, the LED's are powered by a single battery 17 contained within the holder 12. However, a system having two or more batteries is also feasible. Further, the battery, or some other, preferably low power, electrical power source, could be used. Either of these power sources could be located outside of holder 12 with electrical power being supplied to the LED's through wires which enter holder 12. For example, the external electrical power might be supplied by electrical wiring in the shelving unit in which the illuminated sign is to be used.

In a preferred embodiment, the LED's are controlled by circuitry on circuit board 15, so as to periodically turn on and off to create a flashing of the light from the LED. This flashing might be done at a slow rate to provide a visual effect, or might be done so rapidly as to create a non-visual effect. For example, when the LED is flashed at a rate greater than approximately 25 times per second, a non-visual flashing effect is achieved. By turning the LED on and off rapidly in this fashion, the battery light can be extended since the LED would be off for a portion of time, and drawing little or no power. Accordingly, this flashing can be used to provide power savings for the illuminated sign. Preferably, this non-visual flashing occurs at a rate greater than 25 times per second, and more preferably occurs at a rate of between 30 and 100 times per second.

Thus, to the viewer of the signage system, the appearance of the printed, semi-transparent panel 14 may be either visibly flashing, continuously lit, or the face plate may be flashing at a frequency that gives the appearance of being continuously lit.

The light inside of holder 12 might also be provided by an LED located outside of holder 12 and the light transferred to the inside of holder 12 by the use of fibre optic cable. In Figure 3, an alternative embodiment of the signage system of the present invention is shown wherein one or more external LED's 28 are located outside of holder 12. The light from LED 28 is transferred to holder 12 using fibre optic cable 20. The ends of the fibre optic cable, or the light from the fibre optic cable, pass through holder 12 and illuminate the face plate 14. The number of fibre optic cables selected will vary depending on the design considerations of the signage system in order to avoid the appearance of point source



lighting. However, these considerations are similar to those described hereinabove with respect to the LED system described in Figure 2.

The fibre optic cables 20 are connected to the LED's in a fashion known to those skilled in the art in order that light is passed from the LED's through the fibre optic cable, and is emitted from the end of the fibre optic cable.

In Figure 4, the back surface 16 of holder 12 is shown which has a number of openings for the ends 19 of fibre optic cables 20, which ends 19 can be arranged in a pre-determined pattern to provide for the dispersion of light within the holder. The number of fibre optic cable ends can vary depending on the amount of light needed to illuminate the sign, but preferably a plurality of cable ends 19 are provided. The number of fibre optic cable ends 19 in the back surface 16 of holder 12 is preferably greater than 1 cable end per square inch of face plate surface, and more preferably is between 3 and 10 cable ends per square inch of face plate surface.

In Figure 5, an alternative embodiment is shown which is similar in design to that of the illuminated sign shown in Figure 2. However, in this embodiment, a different type of fibre optic cable 26 is used which is designed to primarily emit light from the side of the cable. In this design, the cable 26 is merely placed within holder 12 so that at least a portion of cable 26 is essentially parallel to face plate 14. The cable 26 might be attached to the back surface 16a of holder 12 in order to avoid movement of cable 26.

In all embodiments, the LED's, where more than one LED is used, can be the same colour, or can be of different colours. By suitably locating the LED's and/or by providing suitable fibre optic connection configurations, it is possible to provide different colours to the face plate, and thus different colours can be displayed on the face plate surface. Also, by illuminating different LED's at different times, the colour displayed on the face plate might be changed.

Thus, it is apparent that there has been provided, in accordance with the present invention, a shelf signage illumination system which fully satisfies the means, objects, and advantages set forth hereinbefore. Therefore, having described specific embodiments of the

present invention, it will be understood that alternatives, modifications and variations thereof may be suggested to those skilled in the art, and that it is intended that the present specification embrace all such alternatives, modifications and variations as fall within the scope of the appended claims.

- 5           Additionally, for clarity and unless otherwise stated, the word “comprise” and variations of the word such as “comprising” and “comprises”, when used in the description and claims of the present specification, is not intended to exclude other additives, components, integers or steps.

We claim:

1. A shelf signage system comprising a sign holder, a semi-transparent face plate on the front of said sign holder, at least one LED light source, and optionally at least one fibre optic cable for transmission of the light generated from said LED light source to the rear of said semi-transparent face plate, wherein said face plate is capable of diffusing light from the light source, and is positioned at a distance from said light source in order to avoid the appearance of a point-source light.
2. A shelf signage system as claimed in Claim 1 wherein said sign holder is opaque.
3. A shelf signage system as claimed in Claim 1 wherein said face plate is made of styrene.
4. A shelf signage system as claimed in Claim 3 wherein a display on said face plate is created on said face plate by lithography.
5. A shelf signage system as claimed in Claim 1 wherein said LED is contained within said sign holder.
6. A shelf signage system as claimed in Claim 5 comprising a plurality of LED's.
7. A shelf signage system as claimed in Claim 6 comprising between 2 and 20 LED's.
8. A shelf signage system as claimed in Claim 7 comprising between 3 and 10 LED's.
9. A shelf signage system as claimed in Claim 1 wherein said LED is powered by a battery.



10. A shelf signage system as claimed in Claim 1 wherein said LED flashes.
11. A shelf signage system as claimed in Claim 10 wherein said LED visibly flashes.
12. A shelf signage system as claimed in Claim 10 which flashes in a non-visible fashion.
- 5 13. A shelf signage system as claimed in Claim 12 wherein said LED flashes at a rate greater than 25 times per second.
14. A shelf signage system as claimed in Claim 13 wherein said LED flashes at a rate between 30 and 100 times per second.
- 10 15. A shelf signage system as claimed in Claim 1 comprising a sign holder, a semi-transparent face plate on the front of said sign holder, one or a plurality of LED lights source, and at least one fibre optic cable for transmission of the light generated from said LED light source to the rear of said semi-transparent face plate.
16. A shelf signage system as claimed in Claim 15 wherein said fibre optic cable provides light primarily through the end of the cable.
- 15 17. A shelf signage system as claimed in Claim 16 comprising a plurality of cable ends within said holder.
18. A shelf signage system as claimed in Claim 17 comprising more than 1 cable end per square inch of face plate surface.
- 20 19. A shelf signage system as claimed in Claim 18 comprising more than 5 cable ends per square inch of face plate surface.

20. A shelf signage system as claimed in Claim 15 wherein said fibre optic cable provides light primarily through the side of said fibre optic cable.
21. A shelf signage system as claimed in Claim 15 wherein said LED light source is outside of said sign holder, and an external fibre optic cable is used to feed the light from said LED source to said sign holder.  
5
22. A shelf signage system as claimed in Claim 6 or Claim 15 wherein said LED's have different colours so that different colours can be displayed on the face plate surface.
23. A method of shelf signage illumination comprising placement of a shelf signage system as claimed in any one of Claims 1 to 22 on the edge of a commercial or retail shelving unit.  
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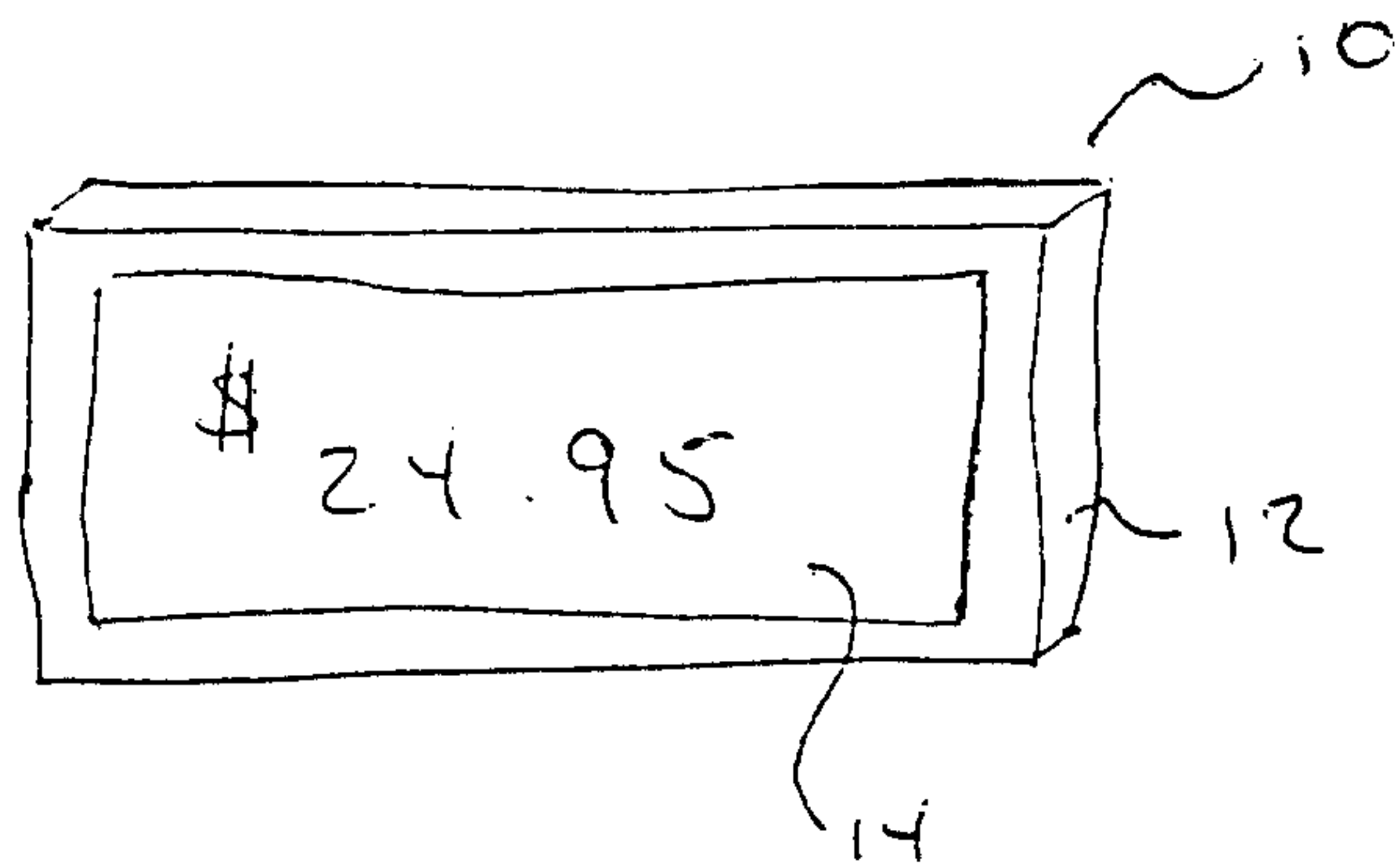


Fig 1

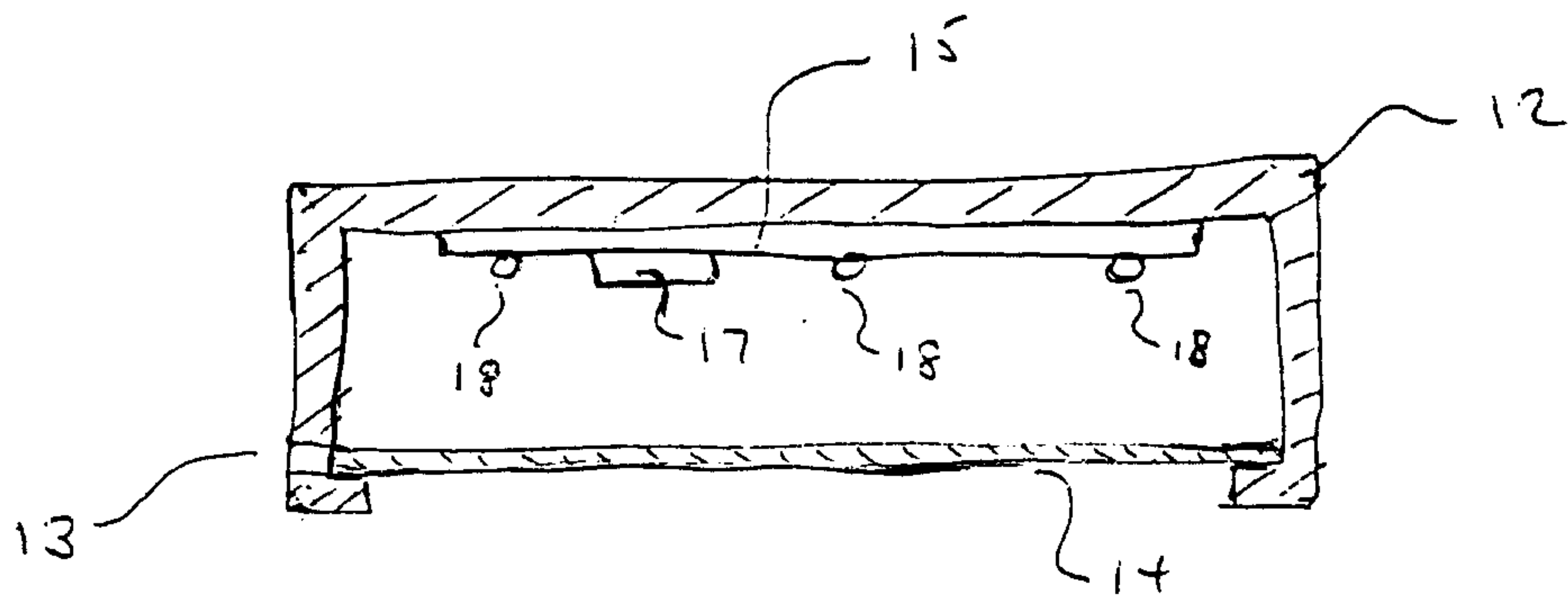


Fig 2



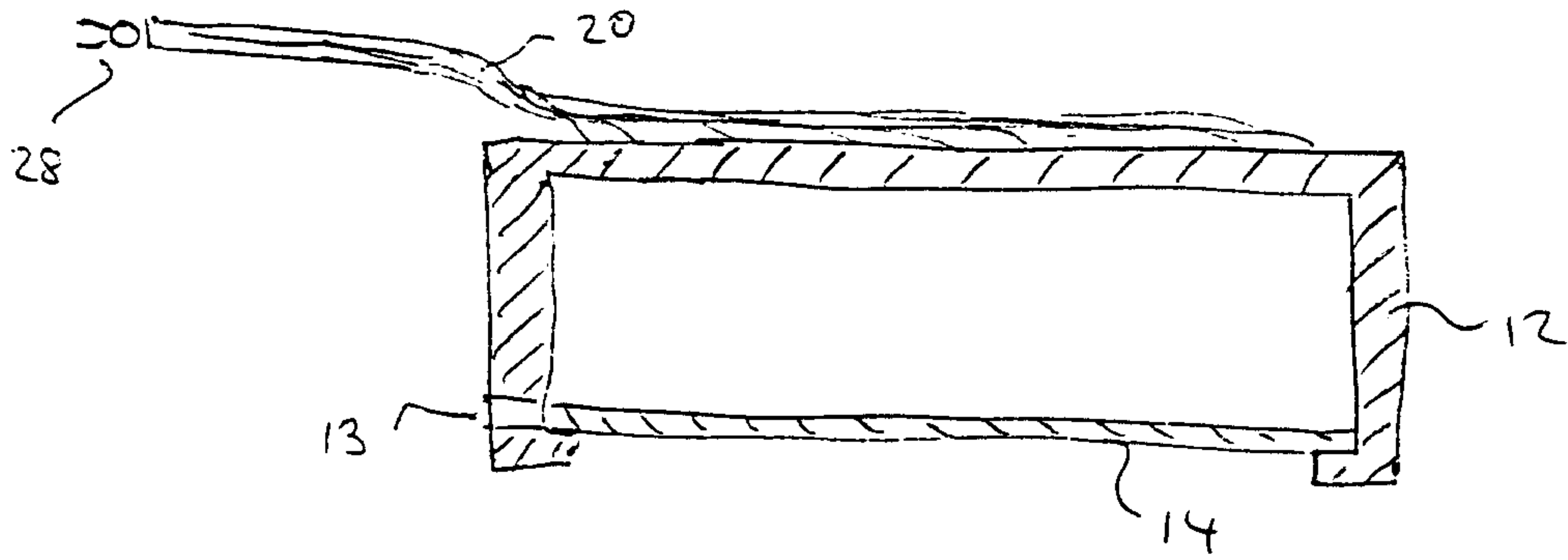


Fig 3

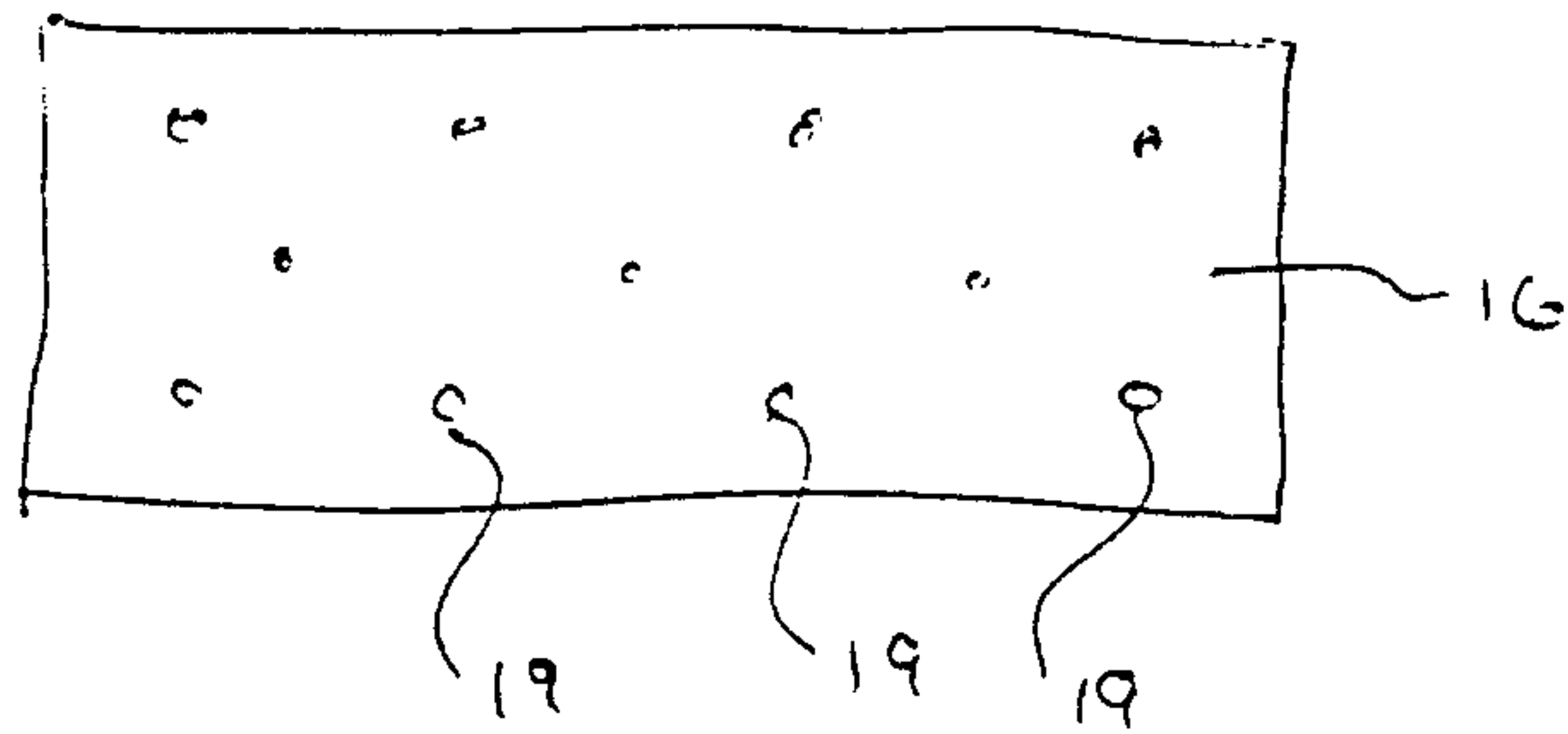


Fig 4

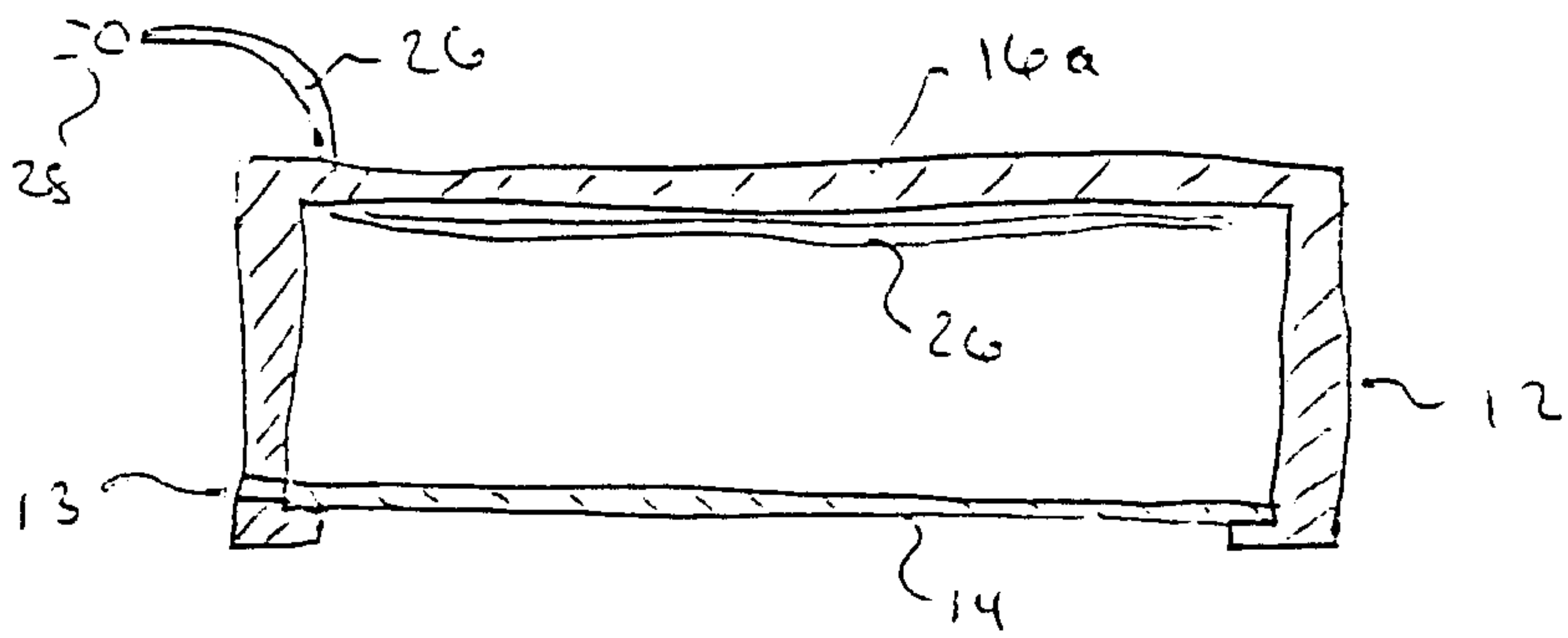
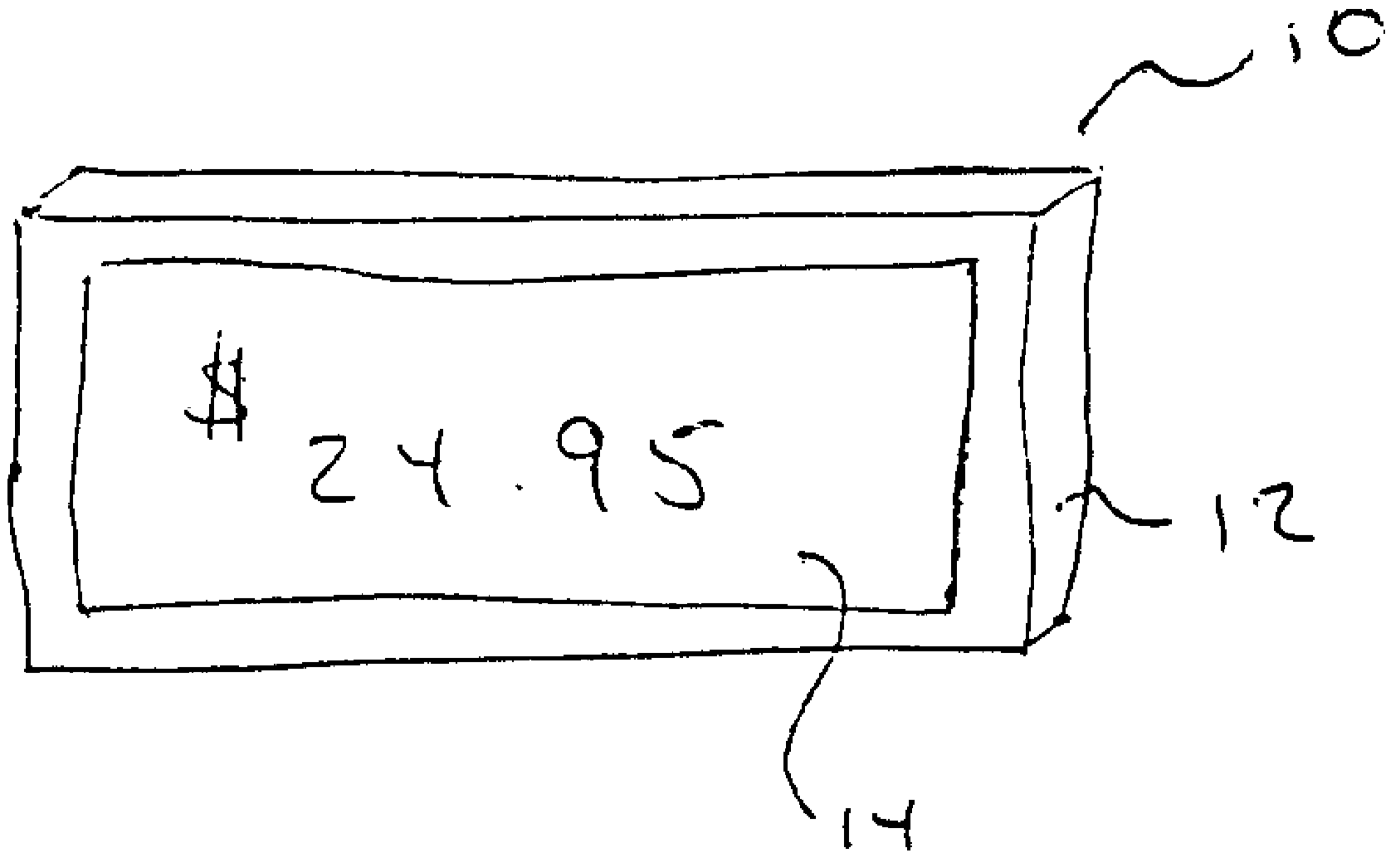


Fig 5



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