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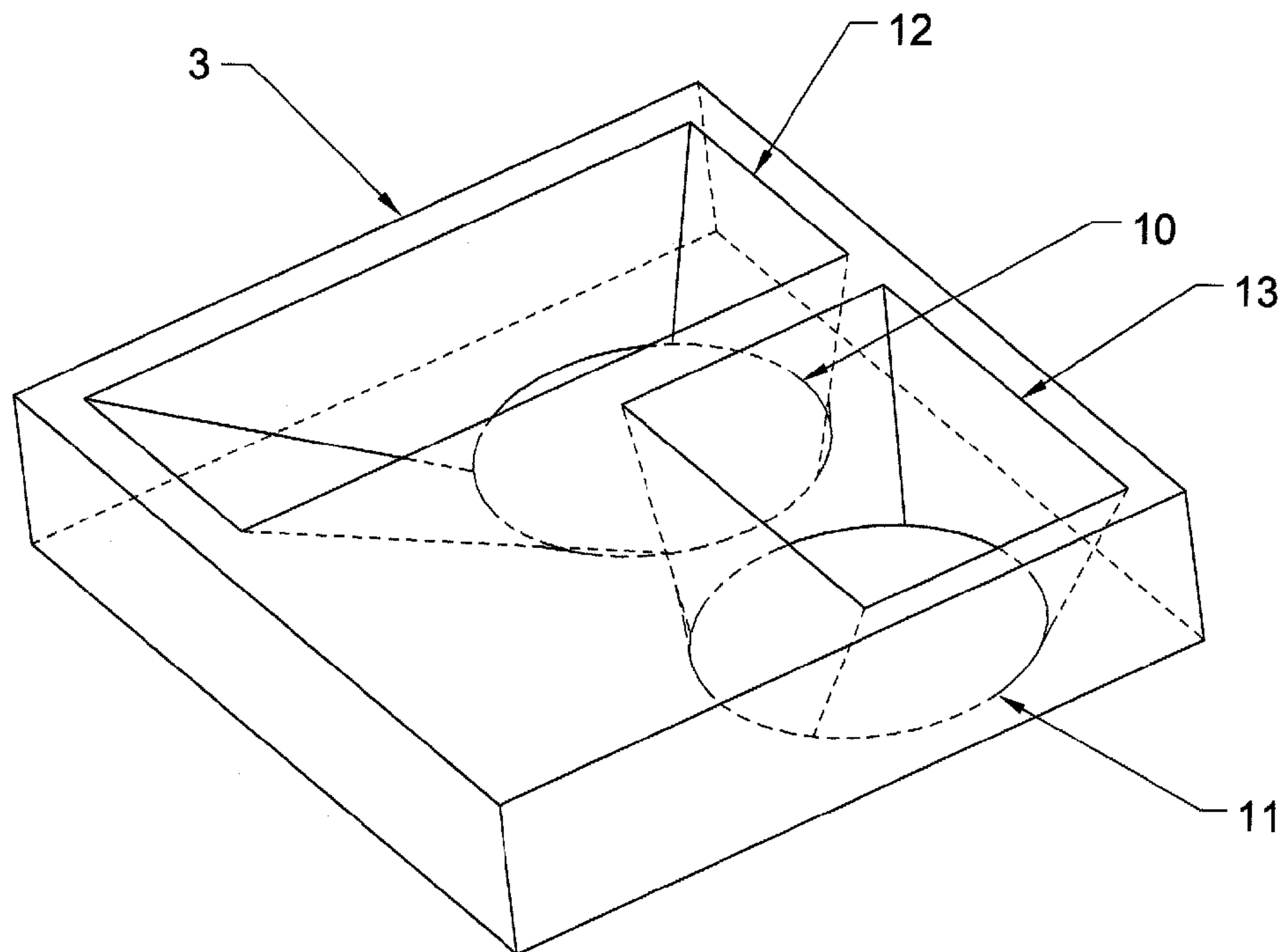
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(54) Titre : ADAPTATEUR MODULAIRE POUR LA DISTRIBUTION D'AIR DE CONDITIONNEUR D'AIR MONOBLOC

(54) Title: MODULAR ADAPTOR FOR PACKAGED AIR-CONDITIONING AIR DISTRIBUTION



(57) **Abrégé/Abstract:**

The invention provides an improved method of transition between supply-and-return-air ducts of packaged heating and air-conditioning units, located on top of a roof, and existing ductwork in the roof of a building. The modular adaptor consists of a flanged top cover, transition piece, protective housing and numerous supports. The top cover will have 2 openings conversely sized and matched to existing sheet metal supply-and-return duct work. The transition piece manufactured from a polymeric material, usually polyurethane, has 2 openings from the top to bottom surfaces matching the supply-and-return-air duct profiles, sizes and locations from the existing duct work and that of the packaged heating and air-conditioning unit. The transition piece is placed within a protective housing on top of the top cover. Multiple supports are fixed between the top cover and the packaged heating and air-conditioning unit to transfer the weight of the unit to the roof structure.



Modular Adaptor for Packaged Air-conditioning Air Distribution Configurations

ABSTRACT OF THE DISCLOSURE

The invention provides an improved method of transition between supply-and-return-air ducts of packaged heating and air-conditioning units, located on top of a roof, and existing ductwork in the roof of a building. The modular adaptor consists of a flanged top cover, transition piece, protective housing and numerous supports. The top cover will have 2 openings conversely sized and matched to existing sheet metal supply-and-return duct work. The transition piece manufactured from a polymeric material, usually polyurethane, has 2 openings from the top to bottom surfaces matching the supply-and-return-air duct profiles, sizes and locations from the existing duct work and that of the packaged heating and air-conditioning unit. The transition piece is placed within a protective housing on top of the top cover. Multiple supports are fixed between the top cover and the packaged heating and air-conditioning unit to transfer the weight of the unit to the roof structure.

Modular Adaptor for Packaged Air-conditioning Air Distribution Configurations

MODULAR ADAPTOR FOR PACKAGED AIR-CONDITIONING AIR DISTRIBUTION CONFIGURATIONS

The invention provides an improved method of transition between supply-and-return-air duct sizes where the duct sizes, relative location and profiles of the air-conditioning unit located on top of a roof differ from the sizes, relative location and profiles of the ducting used inside the building.

BACKGROUND OF THE INVENTION

Frame-shaped structures commonly referred to as roof curbs, are typically used to support heating and air-conditioning units which supply heated or cooled air to conditioned spaces below the roof. The typical roof curb has a rectangular frame body portion, which comprises of four side wall portions, which are secured together at the jobsite, with the assembled body portion extending above the roof and forming a base structure upon which a heating and air-conditioning unit may be operatively placed.

Due to design changes by original equipment manufacturers (OEM) of heating and air-conditioning equipment, constant changes are encountered in the supply and return air configuration of said equipment. This necessitates the use of roof curb adaptors to accommodate new OEM heating and air-conditioning supply-and-return-air dimensions and configuration to existing roof curb supply-and-return-air sheet metal dimensions and configuration. Conventional manufactured adaptors consist of a boxlike enclosure with the four side wall portions of the curb adaptor bolted or welded together at the corners of the curb adaptor. In addition, sheet metal sections has to be bent, tweaked and adapted to accommodate internal supply-and-return-air dimensions and configurations from newly placed heating and air-conditioning units to existing sheet metal supply-and-return-air configuration and dimensions. These internal sheet metal adaptors are fastened to the outside frame shaped curb adaptor structure by using bolts, screws or welding. As is well known in the industry, this traditional method of constructing a roof curb adaptor is time-consuming, relatively expensive and does not always provide a smooth laminar transition.

In view of these problems, limitations and disadvantages, typically associated with conventional roof curb adaptor construction techniques, it can readily be seen that a need exists for a new approach to heating and air-conditioning equipment placement on existing roof curbs. It is to this need that the present invention is directed. The following Canadian application patent is of a typical adaptor found on roofs today:

CA2280222 Brown et al

SUMMARY OF THE INVENTION

Considered broadly, adaptors according to the invention are of modular type, comprising of cover section, a transition piece located on top of the top cover, an enclosure covering the four outer sides of the transition piece and supports located at points upwardly from the cover. The cover has two openings of the same dimensions and configuration as the existing supply-and-return-air duct. The transition consists of a polymeric material, usually polyurethane foam, with various density and size and comprises of two openings of various size in it. The openings in the transition piece align with both the existing and the new duct configuration and size. The two openings in the top cover align with the bottom profiles of the existing building duct configuration and the bottom profiles of the transition piece. The top opening profile of the transition aligns with the supply-and-return-air duct profiles on the heating and air-conditioning units. Supports are fastened at various points of the cover to transfer the weight of the unit to the roof bellow.

In the drawings that form part of this specification,

Fig. 1 is an isometric view of the assembled modular adaptor;

Fig. 2 is an isometric view of the cover rev item (2) on Fig. 1

Fig. 3 is and Isometric view of the transition piece rev item (3 on Fig. 1

DETAILED DESCRIPTION OF THE INVENTION

Modular adaptor 1 illustrated in Fig. 1 comprises of a top cover 2 a transition piece 3 housed inside an enclosure 4 and several structural supports 5. Enclosure section 4 is open on the top and bottom. Transition piece 3 is manufactured from polymeric foam, usually polyurethane foam. Top cover 2 and enclosure 4 are manufactured from suitable sheet metal or polymeric material, typical galvanized sheet metal.

The top cover, illustrated in Fig. 2, depicts profiles and dimensions 6 and 7 as downwardly projected flanges which secure the cover plate on top of the existing roof curb. Profiles 6 and 7 can be manufactured in various ways such as the bending of the outer edges of the top cover or mechanical fastening there of to the top cover plate. The outer dimensions of the top cover plate vary according to the dimensions of the existing roof curb. Profiles 6 and 7 vary with the variation in the top cover dimensions. Profiles 6 and 7 are used to make the invention splash proof and might vary in depth. The top cover has two holes, 8 and 9, matching the existing supply-and-return-air duct size, relative locations, shape and dimension. Holes 8 and 9 is indicated as round holes but might vary from round, to oval, to square or rectangular, depending on the existing duct work.

Fig. 3 illustrates the transition piece manufactured from a polymeric material, typical polyurethane foam. The transition piece has two transition holes in it with potential different dimensions, profiles and locations. The transition surface profiles 10 and 11 at the bottom of the transition piece align with the cut outs in the top cover of Fig 1. 8 and 9 and the transition surface profiles 12 and 13 align with the supply-and-return-air duct profiles from newly placed heating and air-conditioning units. The Bottom and top surface profiles of the transitions are shown as round and rectangular but might vary from round, to oval, to square, or rectangular depending on the existing and mating duct work.

Surrounding the outer four surfaces of the transition, not including the top and bottom, and mounted on top of the top cover, is an enclosure section as illustrated in Fig. 1 4. The enclosure is mechanically fastened to the top cover and the height is shorter than the height of the transition piece as illustrated. The profile of the

enclosure follows the outer profile of the transition piece to the degree of keeping the transition in position relative to the top cover and the newly placed heating and air-conditioning unit.

As seen in Fig.1 support members 5 of general U-shape or Z-formed transverse cross section is placed on top of the top cover to transfer the loads from the newly placed heating and air-conditioning units. The height of the supports 5 is generally lower than the height of the transition piece Fig. 1. The number, location and profile shape of the supports varies with the weight and form of the newly placed heating and air-conditioning unit.

It will be apparent that various changes and modifications can be made without departing from the scope of the invention defined in the claims to follow.

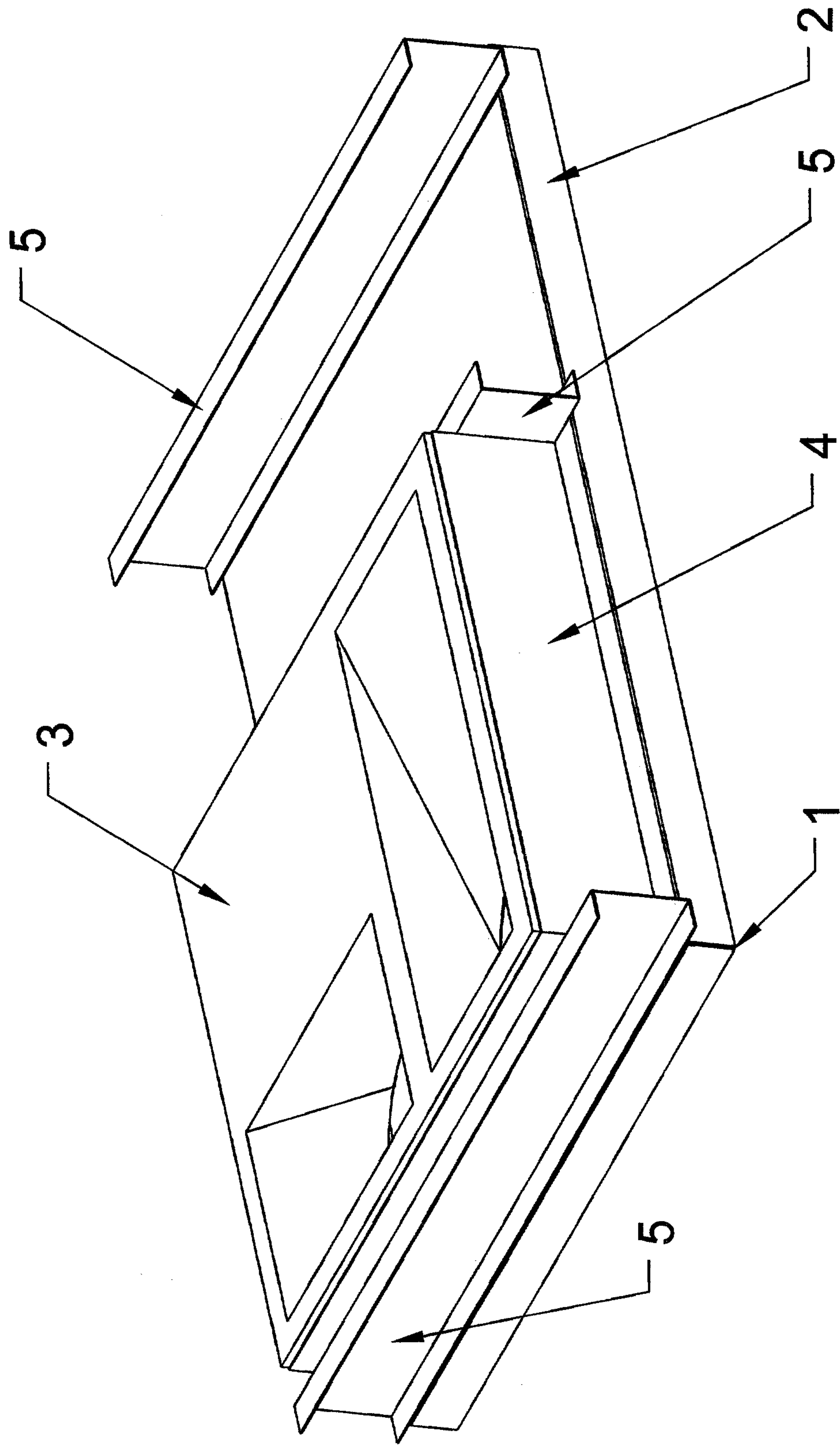


Fig. 1

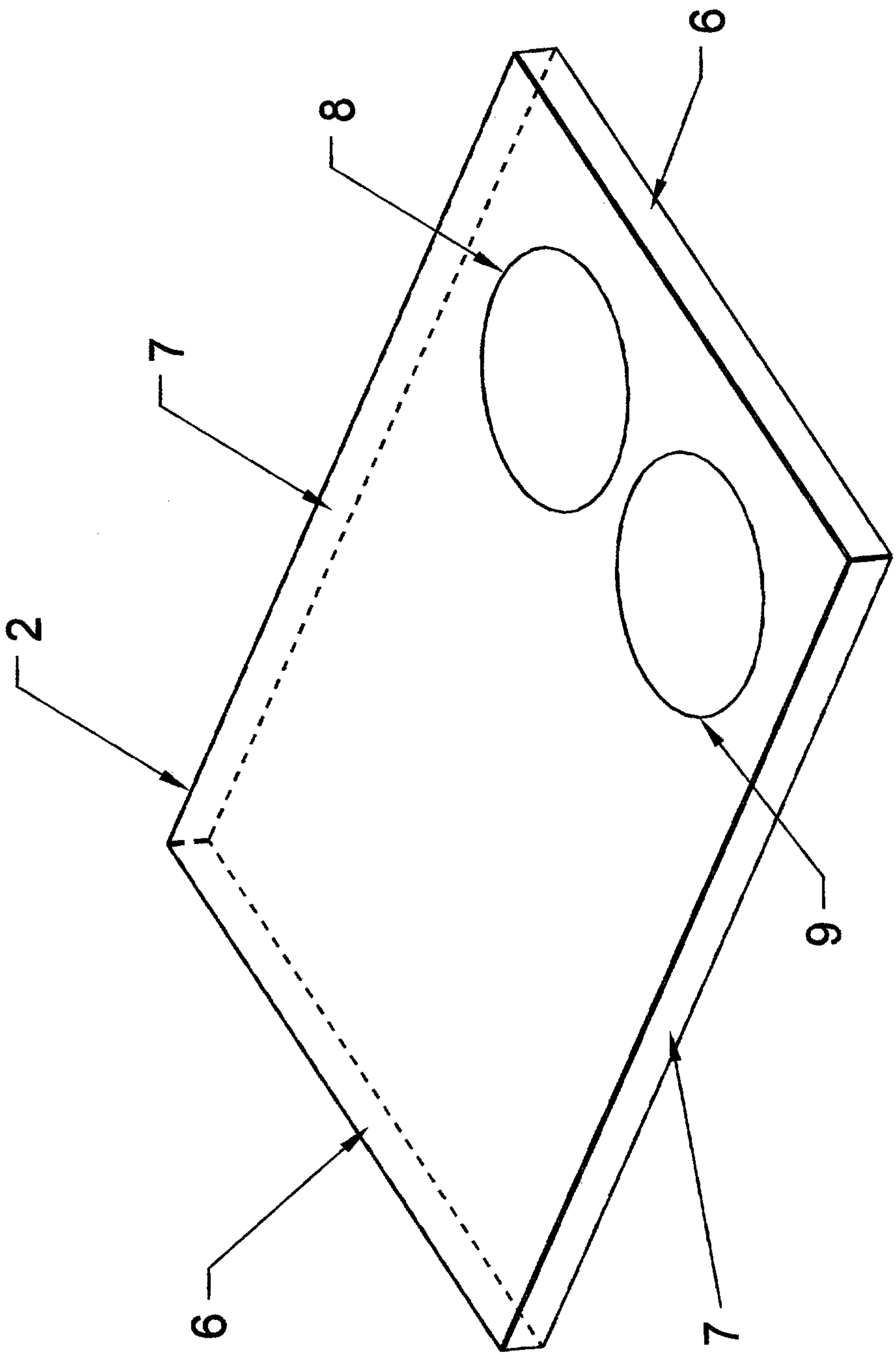


Fig. 2

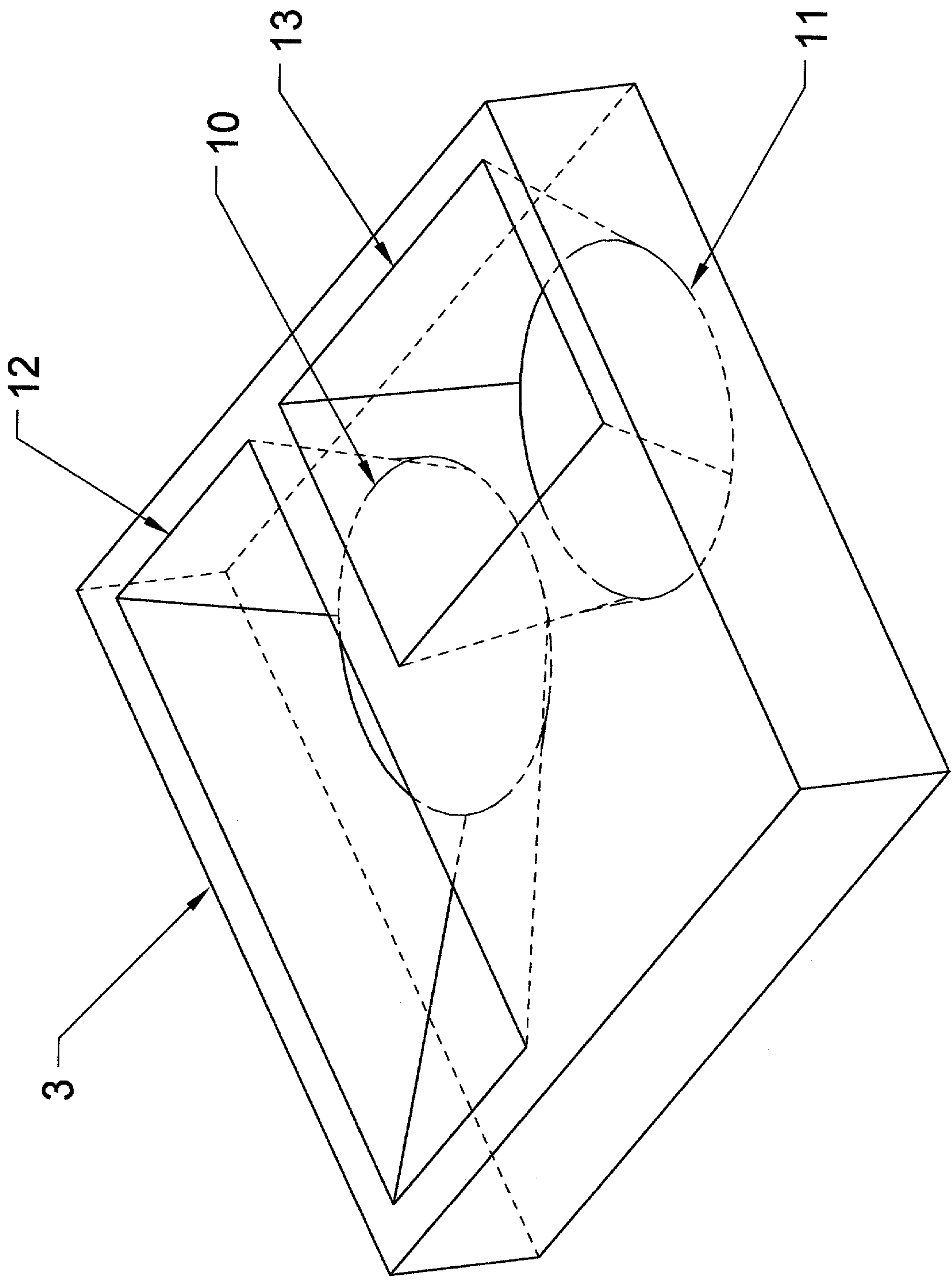


Fig. 3

