OPIC
Office de la propriété intellectuelle du Canada

CIPO
Canadian Intellectual Property Office

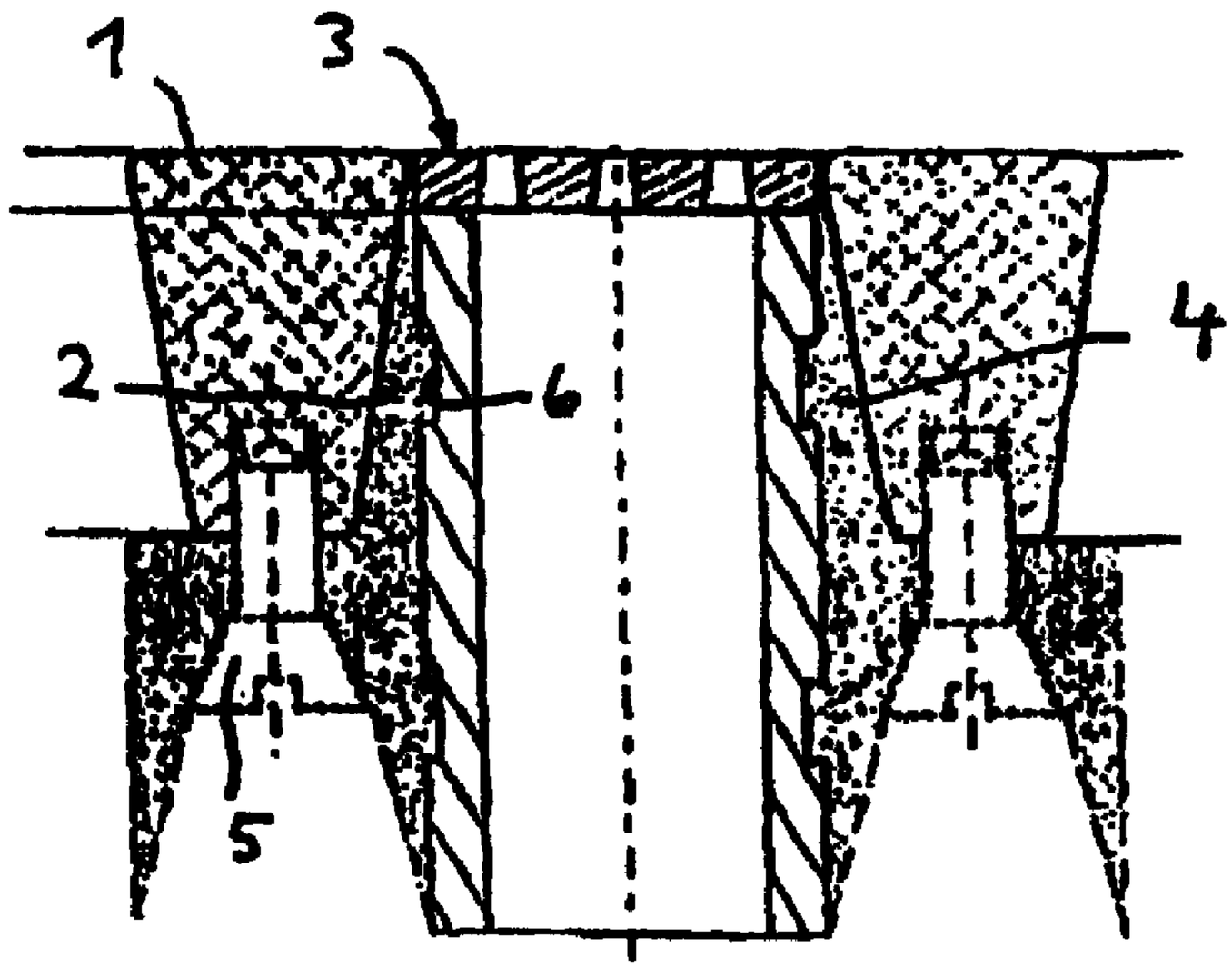
(12) (19) (CA) **Demande-Application**

(21) (A1) **2,283,796**
(86) 1998/03/04
(87) 1998/09/17

(72) FLEISCHHACKER, GERHARD, AT
(71) FLEISCHHACKER, GERHARD, AT

(51) Int.Cl.[6] E03F 5/04, E02D 29/14
(30) 1997/03/10 (A 404/97) AT

(54) **COUVERCLE DE PUITS**
(54) **SHAFT COVER**



(57) L'invention concerne un couvercle de puits (1) muni d'ouvertures (2) pour le passage d'un fluide, au moins un élément filtre (3) étant introduit dans chacune des ouvertures (2). L'espace demeurant entre la surface extérieure de l'élément filtre (3) et la paroi intérieure de l'ouverture (2) est rempli avec un matériau élastique (4).

(57) The invention relates to a shaft cover (1) having openings (2) through which a fluid medium is able to pass. Each of these openings (2) is fitted with at least one filter element (3) and the space left between the outer surface of the filter element (3) and the inner wall of the opening (2) is filled with an elastic material (4).

PCT

WELTORGANISATION FÜR GEISTIGES EIGENTUM
Internationales Büro

INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation 6 :
E03F 5/04, E02D 29/14

A1

(11) Internationale Veröffentlichungsnummer: WO 98/40571

(43) Internationales Veröffentlichungsdatum: 17. September 1998 (17.09.98)

(21) Internationales Aktenzeichen: PCT/AT98/00051

(22) Internationales Anmeldedatum: 4. März 1998 (04.03.98)

(30) Prioritätsdaten:
A 404/97 10. März 1997 (10.03.97) AT

(71)(72) Anmelder und Erfinder: FLEISCHHACKER, Gerhard [AT/AT]; Mölbling 2, A–9330 Treibach (AT).

(74) Anwälte: SONN, Helmut usw.; Riemergasse 14, A–1010 Wien (AT).

(81) Bestimmungsstaaten: AL, AM, AT (Gebrauchsmuster), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ (Gebrauchsmuster), DE (Gebrauchsmuster), DK (Gebrauchsmuster), EE (Gebrauchsmuster), ES, FI (Gebrauchsmuster), GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK (Gebrauchsmuster), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Veröffentlicht
Mit internationalem Recherchenbericht.

(54) Title: SHAFT COVER

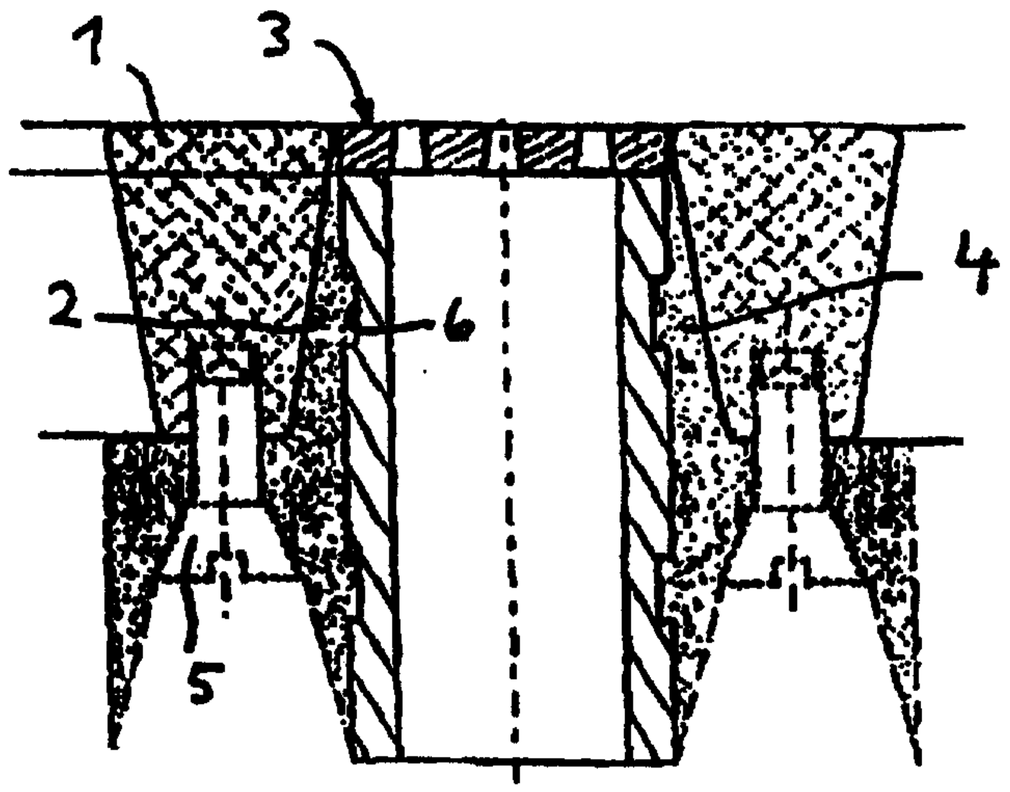
(54) Bezeichnung: SCHACHTABDECKUNG

(57) Abstract

The invention relates to a shaft cover (1) having openings (2) through which a fluid medium is able to pass. Each of these openings (2) is fitted with at least one filter element (3) and the space left between the outer surface of the filter element (3) and the inner wall of the opening (2) is filled with an elastic material (4).

(57) Zusammenfassung

Schachtabdeckung (1), die mit Öffnungen (2) für den Fluidmedium durchtritt versehen ist, wobei in jede der Öffnungen (2) zumindest ein Filterelement (3) eingesetzt ist, und wobei der zwischen der Außenoberfläche des Filterelementes (3) und der Innenwand der Öffnung (2) verbleibende Raum mit einem elastischen Material (4) ausgefüllt ist.



Shaft Cover

The present invention relates to a shaft cover provided with apertures for the passage of a fluid medium, a filtering element for constructing this shaft cover, a method of improving the filtering effect of such shaft covers, and a shaping stamp to be used in this method.

With shaft covers there is the problem that - with the exception of larger rocks or the like which cannot pass the apertures of the shaft lid - all the contaminations contained in the waste water, such as dirt particles, sand, contaminating oil etc. get into the shaft, e.g. a long-distance heat transmission shaft, unimpeded and may lead to deposits on the shaft bottom in the long-distance heat transmission system or become burdens on the environment, respectively.

One solution to this problem is known from AT U 1293 of the same applicant. In the known construction, a large-area filtering element is arranged on the lower side of the shaft lid which extends into the apertures by means of projections. The filtering element is made in one piece of asphalt mixtures, plastics etc..

The present invention aims at further enhancing the resistance to shocks and the self-cleaning property of the known construction. According to the invention, this object is achieved in that in each of the apertures of the shaft cover at least one individual filtering element is inserted, the space remaining between the outer surface of the filtering element and the inner wall of the aperture being filled with an elastic material.

By using discrete filtering elements which are elastically anchored in the apertures, an excellent resistance to deformations, shocks or the like is attained. Moreover, the vibrations and shocks of the shaft lid induced, e.g., when being driven on, cause a mechanical release of any sand or dirt particles possibly caught in the filtering elements and their discharge towards below, substantially increasing the self-cleaning capability of the filtering shaft cover. Finally, also a defined surface of the shaft cover is formed by the inserted filtering elements.

Preferably, the elastic material is an elastomer, preferably a wear-resistant rubber mixture, increasing the abrasion-resistance of the shaft cover.

A preferred embodiment of the invention is characterized in that the free flowed-through cross-section of the filtering element increases from top to bottom. This special configuration of the filtering elements has the effect that solids contained in the waste water can enter only up to a certain grain size; however, once they have penetrated, they will not clog the filtering elements because the free flowed-through cross-section increases, much rather they will be discharged.

The filtering element may, e.g., be made of several layers of porous material or of a material provided with small-diameter channels, as described in AT U 1293, wherein the flowed-through cross-section of the free layers increases from layer to layer. Preferably, however, the filtering element comprises a base body of water-impermeable material in which channels for fluid medium passage are formed whose flowed-through cross-section increases at least step-like, preferably continuously, from top to bottom, thus further enhancing the self-cleaning effect.

In any event it is particularly advantageous if according to a further characteristic of the invention, the filtering element is provided on its outer periphery with ribs and/or grooves for anchoring thereof in the casting material.

It is also particularly advantageous if the elastic material forms a layer covering the lower side of the shaft cover between the filter elements. Preferably, the layer is additionally anchored on the lower side of the shaft cover by aid of screws, rivets or the like.

All these measures are suitable

- to prevent an increased entry of dirt particles into the shaft,
- to ensure sufficient aeration and ventilation of the shaft,
- to allow for an exit of any vapour possibly present in the shaft,
- not to reduce the required strength of the shaft cover,
- not to impair the useful life of the cast construction,
- to improve the shock resistance and/or
- not to impair the strength and the required load bearing

capacity of the lid.

A further aspect of the invention is the provision of a filtering element particularly intended for the construction of such a shaft cover, which filtering element is characterized by a base body of water-impermeable material in which channels are formed for fluid medium passage whose flowed-through cross-section increases at least step-like, preferably continuously, from top to bottom.

In a particularly advantageous embodiment, the filtering element comprises a large-diameter flowed-through portion and a front plate set thereupon which is perforated by apertures opening into the flowed-through portion. This provides for a step-like widening of the flowed-through cross-section from the front plate to the flowed-through portion. Preferably, also the apertures widen at least step-like, preferably continuously, from top to bottom.

It is particularly advantageous for the flow behaviour if the ratio of the entry cross-section of the apertures to the thickness of the front plate ranges from 1:1 to 1:4.

Preferably, the flowed-through portion and/or the front plate are made of metal or plastics, preferably steel. These materials give rise to a particularly robust filtering element.

A third aspect of the present invention resides in providing a method of improving the filtering effect of already existing shaft covers provided with apertures for fluid medium passage, and is characterized in that shaping stamps are inserted into the apertures, which shaping stamps comprise a base body from whose upper side shaping fingers project upwardly the sum of whose cross-sectional areas is substantially smaller than the cross-sectional area of the base body, that the space remaining between the outer surface of the shaping stamp and the inner wall of the aperture is filled by pouring in a casting mass which, in its solidified state, results in an elastic material, and that the shaping stamps subsequently are removed from the solidified casting mass in downward direction.

With this method elastically delimited, downwardly widening apertures are formed in the shaft lid, wherein the shaping stamps can be re-used after producing the apertures. The elastic side walls fo the apertures enhance their self-cleaning

properties during shocks or the like. The fact that in this variant of the invention, no special filtering elements will remain in the casting mass results in further saving costs.

A final aspect of the invention deals with providing a special shaping stamp for use in this method, which shaping stamp is characterized by a base body from whose upper side shaping fingers project upwardly, the sum of whose cross-sectional areas is substantially smaller than the cross-sectional area of the base body.

Preferably, the shaping fingers are configured to taper from bottom to top at least step-like, particularly preferred rounded or conically, thus leaving corresponding apertures in the elastic material.

An advantageous embodiment of the shaping stamp is characterized in that it is provided with a coupling means at its lower side for engagement of a pulling tool, the coupling means preferably being a thraded bore. In this manner, also higher adhesive forces can be overcome when removing the shaping stamp from the elastic material.

The invention will now be explained in more detail by way of exemplary embodiments illustrated in the drawings. In the drawings,

Fig. 1 shows a top view of a shaft lid,

Figs. 2 and 3 show a top view and a section, respectively, of a first embodiment of a filtering element embedded in a shaft lid aperture,

Figs. 4 and 5 show a second embodiment in the same modes of representation,

Figs. 6 and 9 show a top view and a section, respectively, of a first embodiment of a shaping stamp inserted into a shaft lid aperture while the method of the invention is carried out,

Figs. 7 and 8 show a section and a bottom view, respectively, of a further possible embodiment of the shaping stamp,

Figs. 10-12 are side views of further embodiments of the shaping stamp, and

Fig. 13 shows a top view of the shaping stamps of Figs. 10-12.

In Fig. 1, a shaft lid 1 of cast iron is shown, which is

provided with apertures 2 for the passage of liquids or outflow of gases, respectively. One of the apertures 2 is illustrated on a larger scale in Figs. 2-7. In practice, the apertures have a large diameter of e.g. 20-40 mm and may be shaped round, with corners, oval or have any shape desired. The cross-section of the apertures may taper downwardly (Fig. 3), widen downwardly (Fig. 5), or take any desired course.

In each of the apertures 2 of the shaft lid 1, a filtering element 3 is inserted with an elastic material 4 being interposed. The material 4 either closes flush with the upper side and the lower side of the shaft lid 1 (Fig. 3), or it covers the lower side of the shaft lid as a layer 4 between the filtering elements 3 (Fig. 5), in which case it may be additionally fastened to the lower side of the shaft lid 1 by means of optional screws 5, rivets, cast lugs or the like.

The filtering element 3 is embedded in the material 4 by positive engagement and may be provided with grooves 6, ribs or the like at its outer periphery so as to improve the positive engagement with the material 4.

The elastic material 4 preferably is a casting material which is elastic in its "solidified" state, e.g. wear-resistant rubber, elastic plastics or any desired elastomer.

The filtering element 3 may have any desired construction as long as its flowed through cross-section increases in the direction of flow, as described, e.g., in AT U 1293. In the embodiments illustrated in Figs. 2-5, the filtering element 3 is composed of a tubular flowed-through portion 7 of large diameter and a front plate 8 placed thereupon which is perforated by apertures 9 opening into the interior of the flowed-through portion 7. The flowed-through cross-section of the apertures 9 in turn widens conically from top to bottom. The apertures 9 may be arranged in any desired pattern, e.g. as illustrated in Figs. 2 and 4. On their entry side, the diameter of the apertures preferably is 1 to 7 mm (yet also larger, depending on the respective use). The ratio of the diameter of the apertures 9 to the thickness of the front plate preferably ranges from 1:1 to 1:4.

Both, the flowed-through portion 7 and the front plate 8 are made of a hard material, the flowed-through portion being made

of metal or plastics, and the front plate being made of steel, e.g.. The flowed-through portion 7 and the front plate 8 may also be made in one piece. Moreover, also other flowed-through cross-sectional enlargements than those mentioned are possible; the apertures 9 and the flowed-through portion 7 may, e.g., have any desired cross-section and widen step-wise downwardly.

Figs. 6-13 show an alternative method of improving the filtering effect of conventional shaft lids 1, wherein shaping stamps 10 are inserted in each one of the apertures 2 prior to or during casting of the elastic material 4. The shaping stamps 10 may, e.g., be mounted on a mutual carrier plate (not illustrated), or they may be inserted individually.

Each shaping stamp 10 is composed of a base body 11 and shaping fingers 12 projecting upwardly therefrom, the sum of the cross-sectional areas of all the shaping fingers 12 being smaller than the cross-sectional area of the base body 11, so that upon removal of the shaping stamp 10 from the solidified casting mass, passage apertures will result in the elastic material 4 formed having flowed-through cross-sections that increase from top to bottom. The cross-sections of the base body 11 and of the shaping fingers 12 may be as desired, e.g. round, oval, with corners, etc.. The passage apertures left in the casting mass may, in particular, have the cross-sectional configuration mentioned above in connection with the filtering element 3.

If individual shaping stamps 10 are used, the latter may be provided with a coupling means at their lower side, such as a threaded bore 13, for engagement of a special tool for pulling the shaping stamps 10 out of the solidified casting mass 4.

The invention is, of course, not limited to the exemplary embodiments illustrated. For instance, the number, size and grouping of the apertures 9 in the filtering element 3 and of the shaping fingers 12 of the shaping stamp 10, respectively, is completely arbitrary, as long as the afore-mentioned flowed-through cross-sectional relationships result therefrom.

Claims:

1. A shaft cover provided with apertures for the passage of a fluid medium, characterized in that in each of the apertures (2) at least one individual filtering element (3) is inserted, the space remaining between the outer surface of the filtering element (3) and the inner wall of the aperture (2) being filled with an elastic material (4).

2. A shaft cover according to claim 1, characterized in that the elastic material (4) is an elastomer, preferably an wear-resistant rubber mixture.

3. A shaft cover according to claim 1 or 2, characterized in that the free flowed-through cross-section of the filtering element (3) increases from top to bottom.

4. A shaft cover according to any one of claims 1 to 3, characterized in that the filtering element (3) comprises a base body of water-impermeable material in which channels (9) for fluid medium passage are formed whose flowed-through cross-section increases at least step-like, preferably continuously, from top to bottom.

5. A shaft cover according to any one of claims 1 to 4, characterized in that the filtering element (3) on its outer periphery is provided with ribs and/or grooves (6) for anchoring thereof in the elastic material (4).

6. A shaft cover according to any one of claims 1 to 5, characterized in that the elastic material (4) forms a layer (4') covering the lower side of the shaft cover (1) between the filter elements (3).

7. A shaft cover according to claim 6, characterized in that the layer (4') is additionally anchored on the lower side of the shaft cover by aid of screws (5), rivets or the like.

8. A filtering element for a shaft cover according to any one of claims 1 to 7, characterized by a base body of water-impermeable material in which channels (9) are formed for fluid medium passage whose flowed-through cross-section increases at least step-like, preferably continuously, from top to bottom, wherein the ratio of the entry cross-section of the apertures (9) to the thickness of the front plate (8) ranges from 1:1 to 1:4.

9. A filtering element according to claim 8, characterized by a large-diameter flowed-through portion (7) and a front plate (8) set thereupon which is perforated by apertures (9) opening into the flowed-through portion (7).

10. A filtering element according to claim 9, characterized in that the apertures (9) widen at least step-like, preferably continuously, from top to bottom.

11. A filtering element according to any one of claims 8 to 10, characterized in that it is provided with ribs and/or grooves (6) at its outer periphery for anchoring thereof in the casting material (4).

12. A filtering element according to any one of claims 8 to 11, characterized in that the flowed-through portion (7) is made of metal or plastics.

13. A filtering element according to any one of claims 8 to 12, characterized in that the front plate (8) is made of metal or plastics, preferably of steel.

14. A method of improving the filtering effect of a shaft cover provided with apertures for fluid medium passage, characterized in that

- shaping stamps (10) are inserted in the apertures (2), which shaping stamps comprise a base body (11) from whose upper side shaping fingers (12) project upwardly the sum of whose cross-sectional areas is substantially smaller than the cross-sectional area of the base body (11),
- the space remaining between the outer surface of the shaping stamp (10) and the inner wall of the aperture (2) is filled by pouring in a casting mass which, in its solidified state, results in an elastic material (4), and
- the shaping stamps (10) subsequently are removed from the solidified casting mass (4) in downward direction.

15. A shaping stamp for a method according to claim 14, characterized by a base body (11) from whose upper side shaping fingers (12) project upwardly, the sum of whose cross-sectional areas is substantially smaller than the cross-sectional area of the base body (11).

16. A shaping stamp according to claim 15, characterized in that the shaping fingers (12) are configured to taper from bottom to top at least step-like.

17. A shaping stamp according to claim 15 or 16, characterized in that the shaping fingers (12) are configured to taper rounded or conically from bottom to top.

18. A shaping stamp according to any one of claims 15 to 17, characterized in that it is provided with a coupling means (13) at its lower side for engagement of a pulling tool.

19. A shaping stamp according to claim 18, characterized in that the coupling means (13) is a threaded bore.

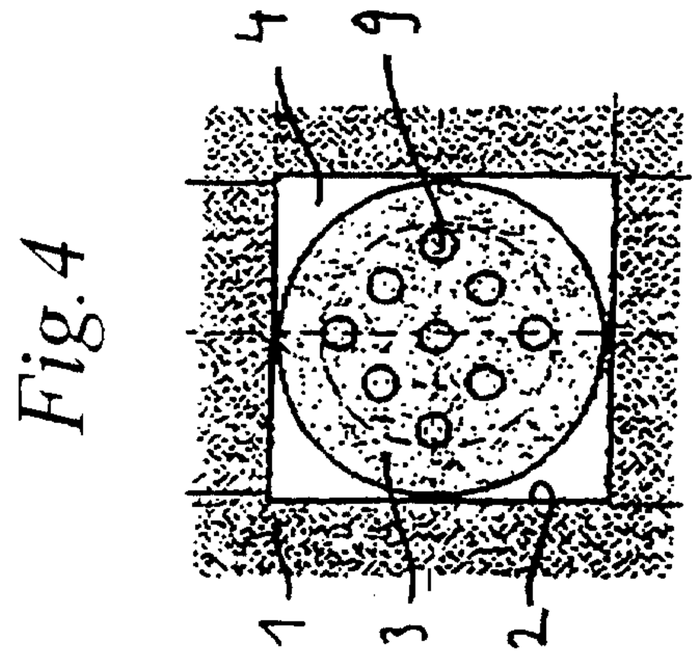


Fig. 4

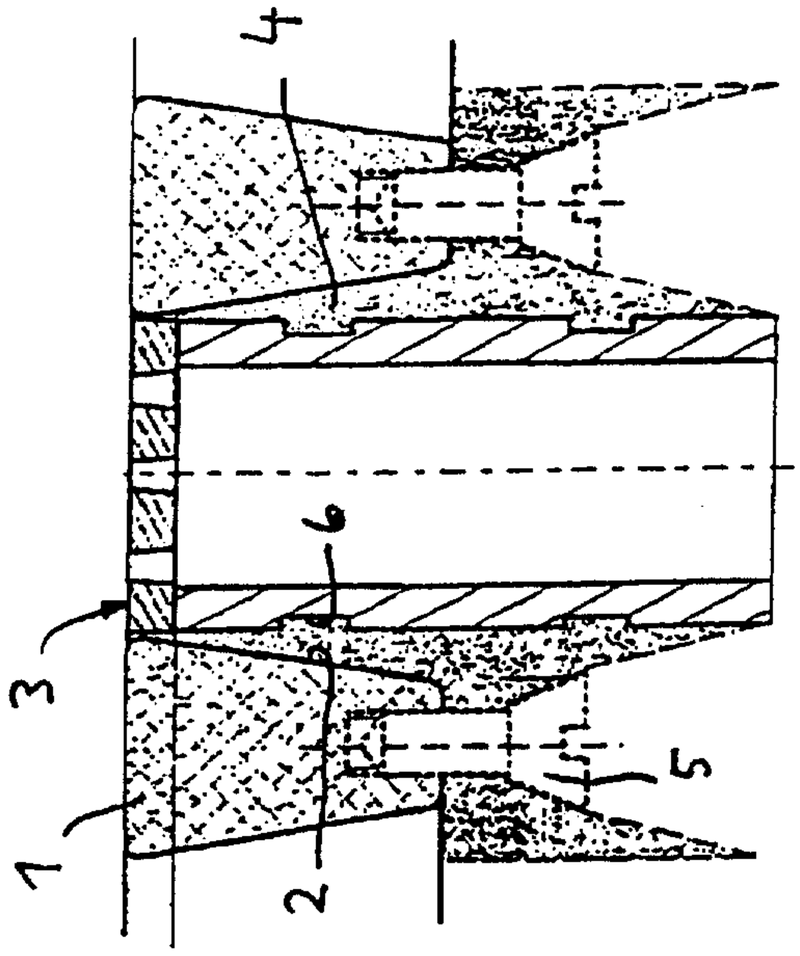


Fig. 5

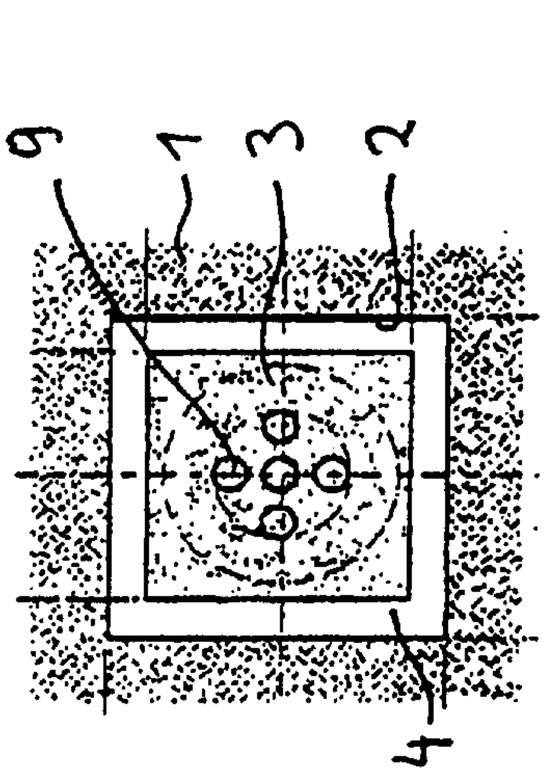


Fig. 2

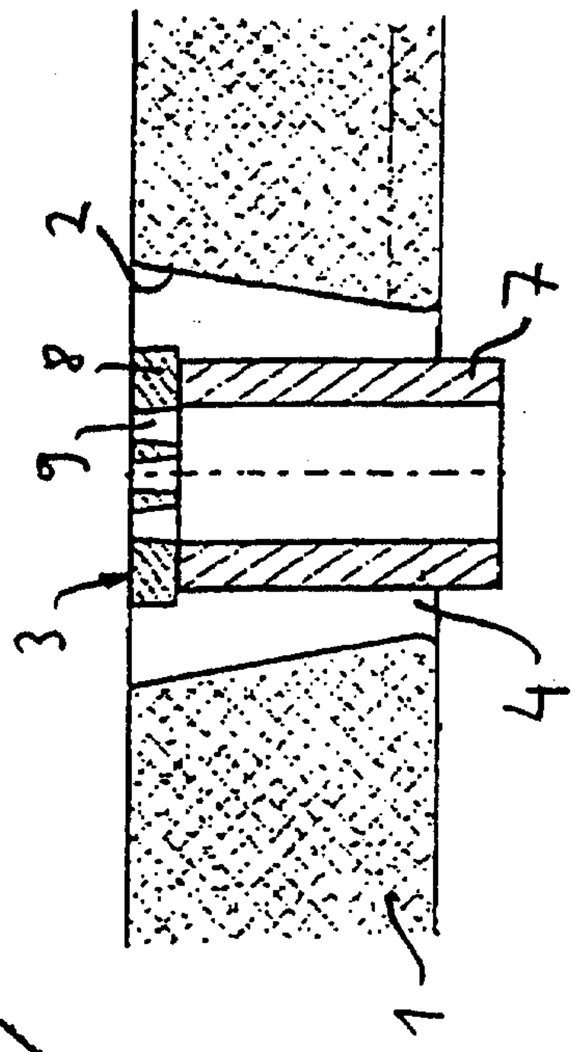


Fig. 3

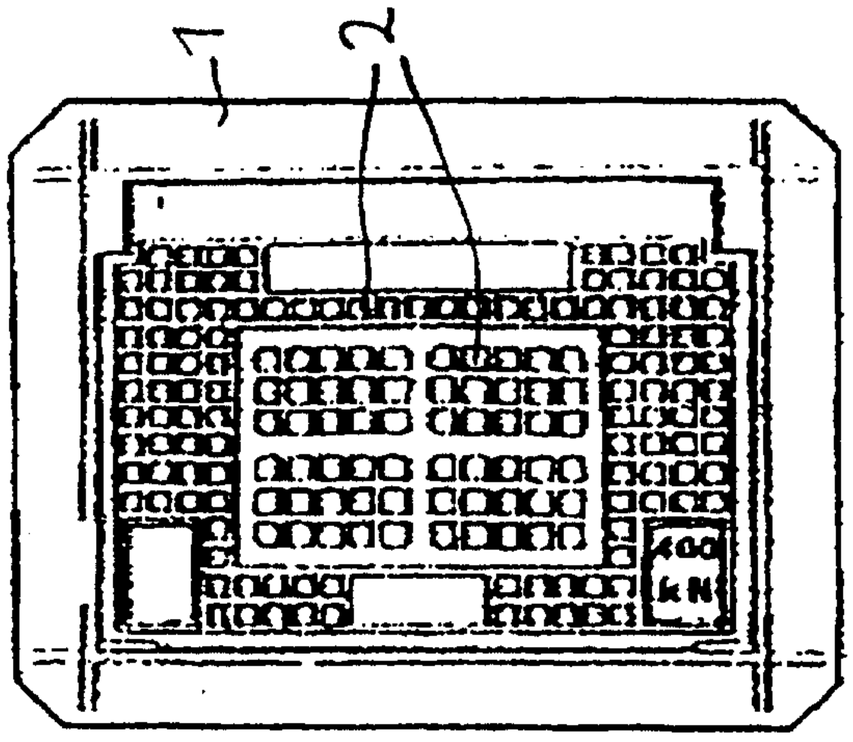


Fig. 1

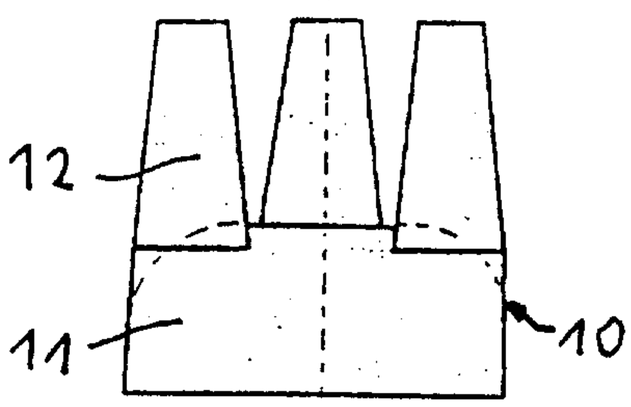


Fig.10

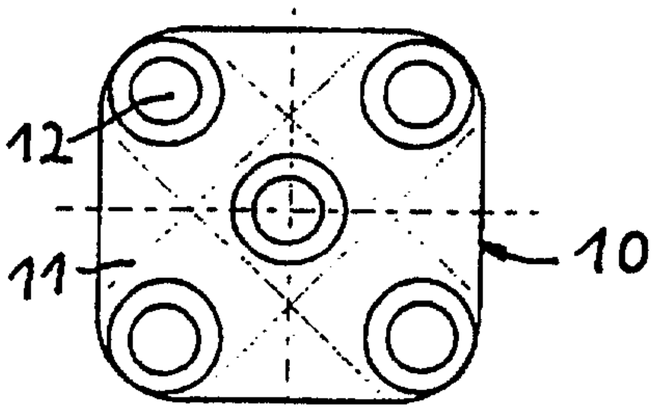


Fig.13

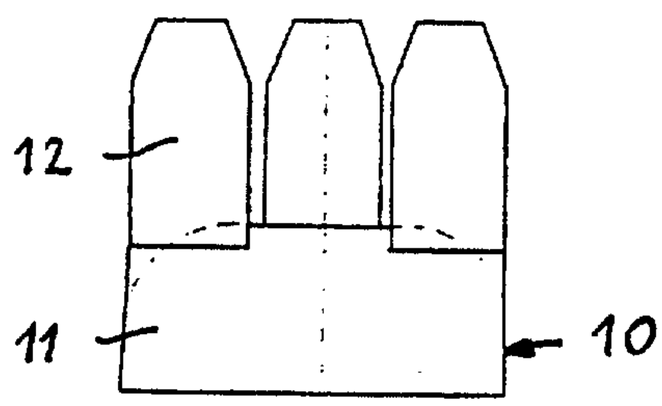


Fig.11

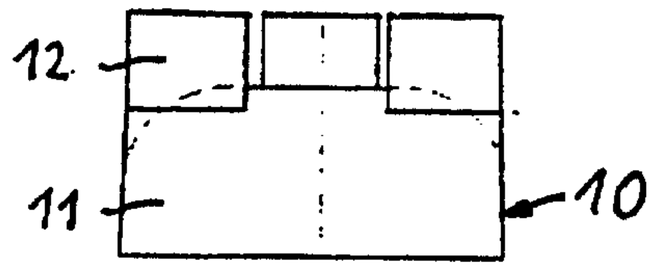


Fig.12

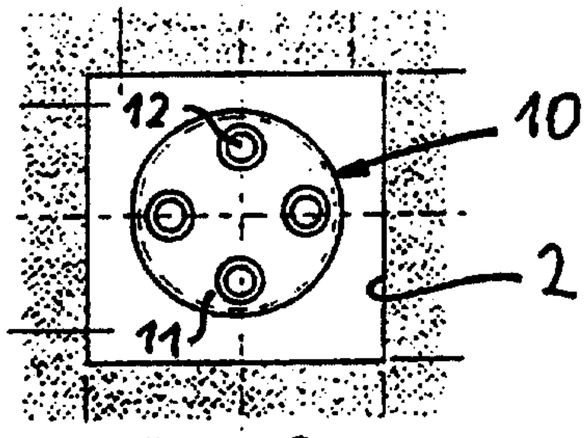


Fig.9

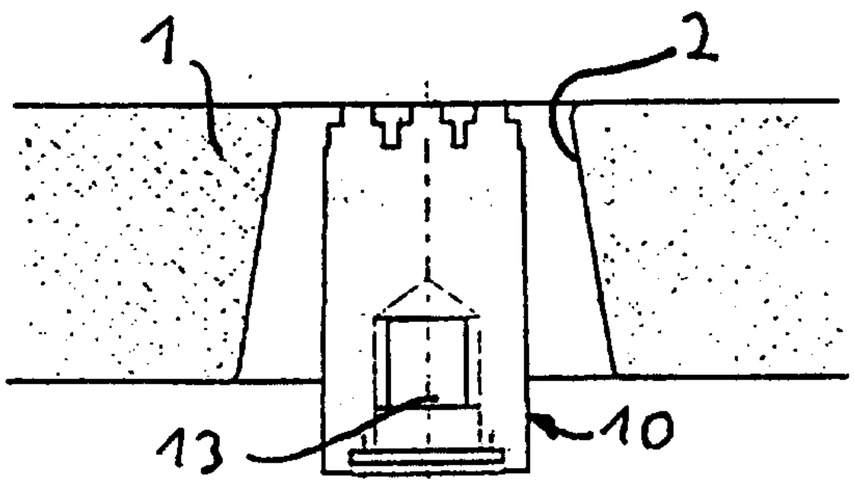


Fig.6

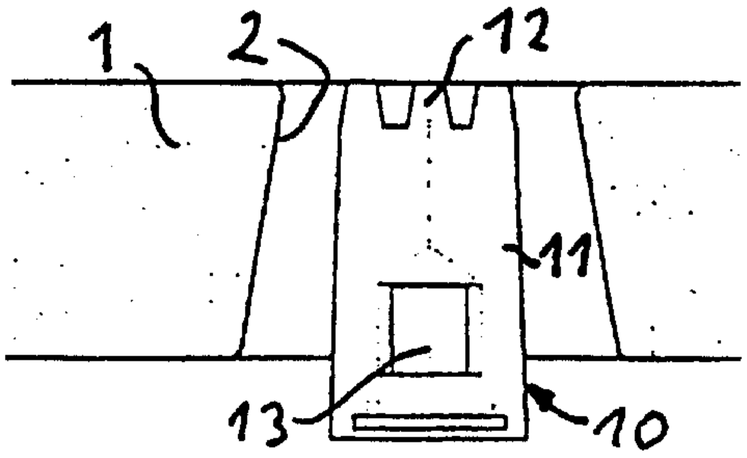


Fig.7

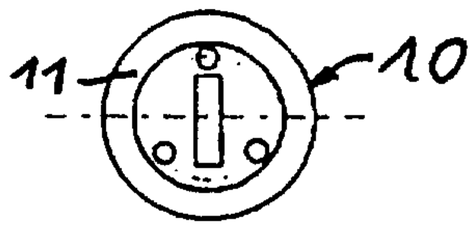


Fig.8