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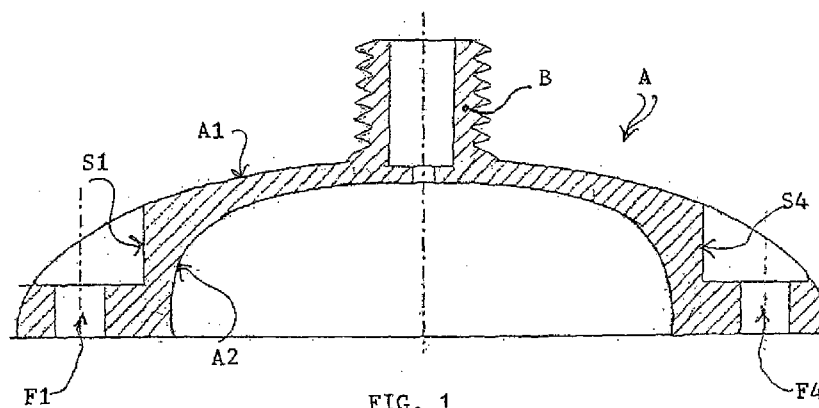
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(54) Title: PLASTIC AND FIBREGLASS FLANGE FOR SURGE TANKS



(57) Abstract: The present patent relates to the sector of surge tanks for pumps and boilers, and particularly concerns a new flange made of plastic and fibreglass for assembling on surge tanks. The flange has a dome-like geometrical shape, that is concave on the underside, designed to reinforce it and to reduce the amount of material needed to make it. Said flange is distinctive in that it is shaped so as to ensure perfect geometrical compatibility with the surge tank on which it is assembled and the tightness of the butyl (or other material) seal.

PLASTIC AND FIBREGLASS FLANGE FOR SURGE TANKS

DESCRIPTION

The present patent relates to the sector of surge tanks for pumps and boilers, and particularly concerns a new flange made of a fibreglass-reinforced plastic material for assembling on such surge tanks.

In the sector of surge tanks for pumps and boilers, there are currently various known types of flange for assembling on surge tanks. A known type of flange comprises a stainless steel plate with a welded threaded connection on the plate and 6 holes homogeneously distributed around its circumference. Said flange is suitable for being assembled on the body of a surge tank, on a flat threaded ring, by tightening it in place with 6 corresponding screws. The edge of the butyl (or other elastomer) membrane in the surge tank is inserted between the flange and the ring to serve as a seal.

Another type of known flange consists of a galvanised steel plate complete, as in the previous case, with a threaded connection welded onto the plate and 6 holes evenly distributed around its circumference. Said flange is designed to be assembled on the body of the surge tank on a flat threaded ring, by tightening it in place with 6 corresponding screws. The edge of the butyl (or other elastomer) membrane in the surge tank is inserted between the flange and the ring to serve as a seal.

The above-described types of flange for assembling on surge tanks have several drawbacks. While the first type, being made of stainless steel, affords a high level of resistance to the effects of corrosion or oxidation in contact with the water on the one hand, on the other it entails particularly high production costs.

The second, being made of galvanised steel, is more vulnerable to the aggressive action of the water and has production costs that, though lower

than in the former case, are still high.

To overcome the above-mentioned drawbacks, a new type of thermoformed flange has been designed, preferably made of polypropylene and fibreglass, for assembling on surge tanks.

- 5 The main technical aim of the new type of flange is to eliminate the above-mentioned drawbacks of the known state of the art.

As part of the main goal, an important object of the present invention is to reduce the production costs, without affecting the quality level and efficacy of the flange.

- 10 Another important object of the present invention is to eliminate the corrosive-oxidising effects due to the action of the water.

Another important object of the present invention is to ensure compliance with non-toxic requirements for use with foodstuffs.

- 15 Another important object of the present invention is to be completely suitable for recycling.

- These and other direct and complementary objects are achieved by the new invention, a thermoformed flange for assembling on surge tanks, made of polypropylene and fibreglass. The characteristics of the new invention are better clarified by the description that follows, with reference to the drawings, which are attached as a non-limiting example.
- 20

The attached drawing gives a non-limiting example of a practical embodiment of the invention.

- Figure 1 shows a cross-sectional view of the flange;
- Figure 2 shows a view from above;
- 25 - Figure 3 shows a view from above of the flange in a possible embodiment with four holes (F1-F4).

With reference to the figures previously mentioned and presented in the attached drawing 1, the flange (A) is circular in shape and complete with 4

- or 6 holes, (F1-F4 or F1-F6), evenly distributed around its circumference and suitable for containing screws for fixing the flange to the surge tank. Coinciding with said holes, there are suitable seats (S1-S4 or S1-S6) designed to provide ample space for the insertion of fixing tools. The flange
- 5 (A) comprises a threaded connection (B) located at its centre and designed for its connection to the hydraulic system. As shown in the cross-sectional view in fig.1, the flange has the geometrical shape of a dome (A1), the lower portion (A2) being concave, designed to make the flange stronger and to reduce the quantity of material required.
- 10 The flange can also be thermoformed in another geometrical shape comprising a cylindrical disc-shaped body with suitable holes for the fixing screws, and with cross walls in the upper portion, again for the purpose of reducing the quantity of material required and increasing its strength. The geometries obtained ensure a perfect geometrical compatibility with the
- 15 surge tank on which the flange is assembled and the tightness of the seal assured by the butyl (or other elastomer) surge tank lining. Moreover, this shaping is straightforward and suitable for enabling the flange to be manufactured by injection moulding, with a consequently marked reduction in production costs.
- 20 The new thermoformed flange is preferably made of a polypropylene (Tecnoprene) and fibreglass.
- From studies conducted, this plastic material was found the most suitable for various reasons:
- it is certified as non-toxic by the Food and Drug Administration and
 - 25 consequently suitable for applications with foodstuffs;
 - it is unaffected by the corrosive-oxidising effect of water;
 - it is fully recyclable.

From the tests conducted, the flange was found amply compatible with the

temperatures and pressures to which it is submitted even in extreme working conditions.

In practice, it was established that the present invention provides a solution to the previously-stated technical goal and objects.

- 5 Thus, with reference to the above description and to the attached drawing, the following claims are advanced.

CLAIMS

1. A flange for assembling on surge tanks in water, heating and sanitary systems, characterised in that it is made of a thermoformed material consisting of polypropylene and fibreglass.
- 5 2. A flange according to claim 1, characterised in that it comprises a circular crown on its underside, with suitable holes for containing fixing screws.
3. A flange according to claim 1 and 2, characterised in that it can comprise an upper portion with a dome-shaped upper surface and a concave
10 lower surface.
4. A flange according to claims 1, 2, characterised in that it can comprise an upper portion with a circular body with upper reinforcement cross walls.
5. A flange according to claims 1, 2, 3 and 4, characterised in that, in
15 the upper portion, it comprises a threaded connection thermoformed therewith, suitable for ensuring the flange's connection to the hydraulic system.
6. A flange according to claims 1, 2, 3, 4 and 5, characterised in that said material consists of the polypropylene Tecnoprene.
- 20 7. A flange according to claims 1, 2, 3, 4, 5 and 6, characterised in that said thermoformed material contains fibreglass.
8. A flange according to claims 1, 2, 3, 4 and 5, characterised in that it comprises fixing holes and seats that are wider than the holes for the corresponding screws, in order to provide sufficient space for the fixing
25 tools.
9. A flange according to any or any combination of the previous claims, characterised in that it comprises all the above-described characteristics, as shown and claimed in the present patent.

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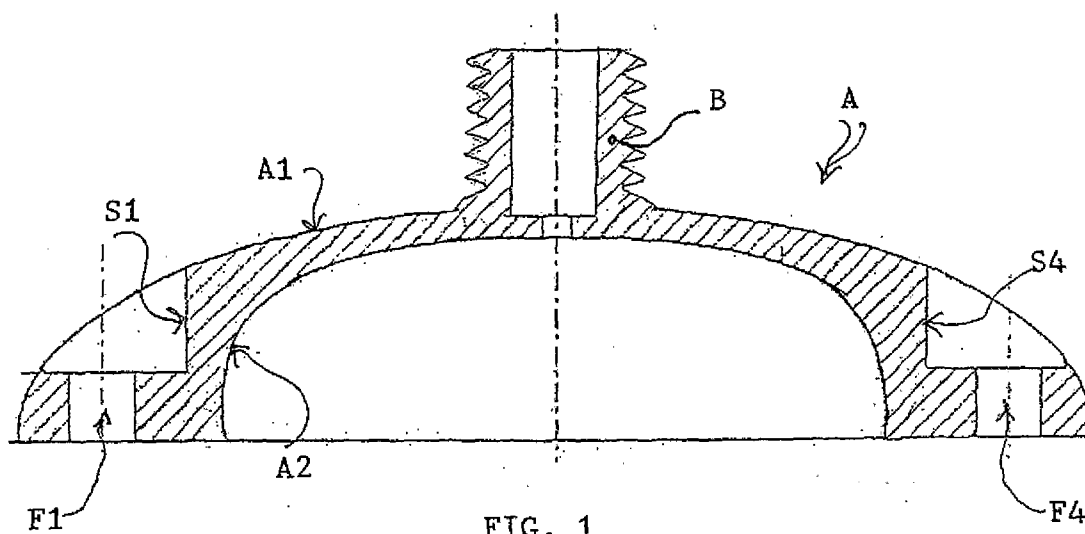


FIG. 1

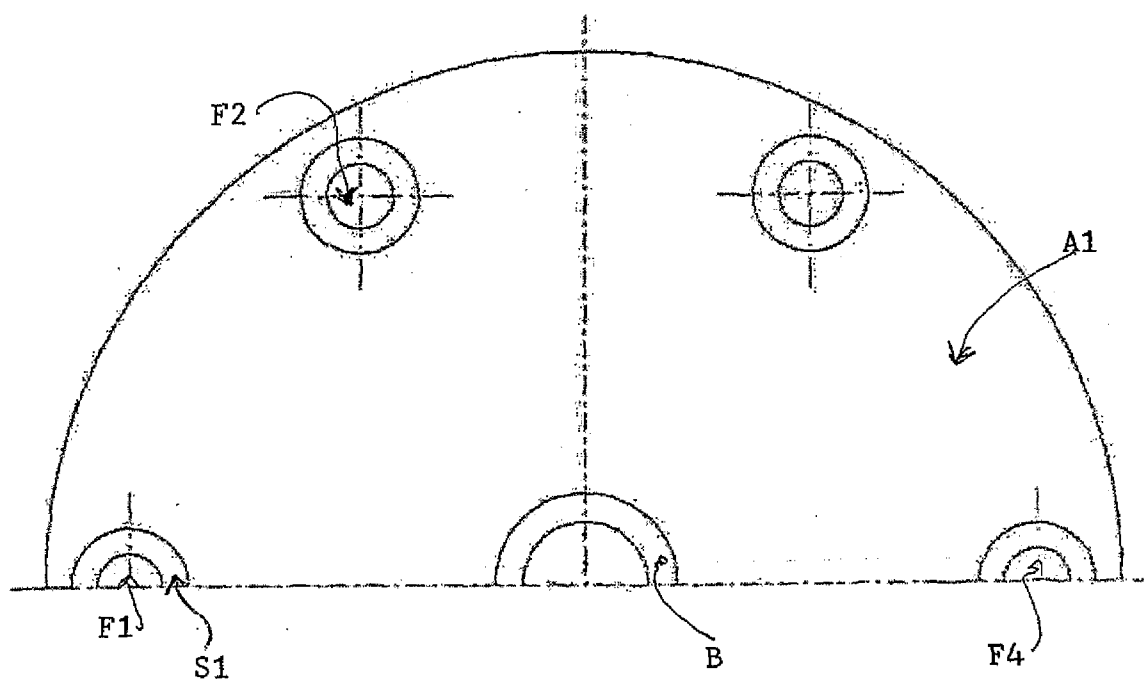


FIG. 2

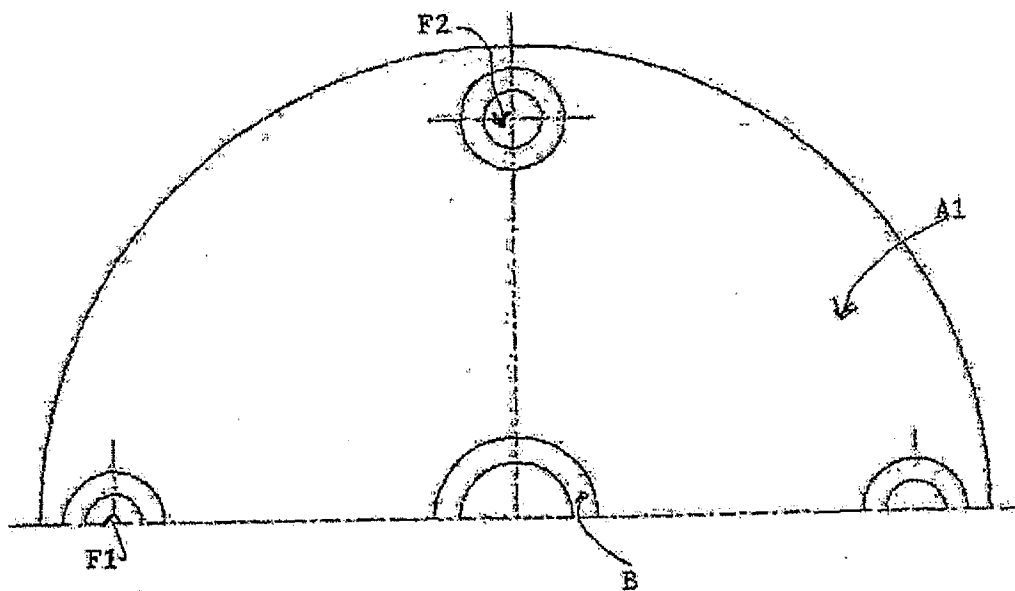


Fig.3