Nov. 26, 1968 B. R. LIPE ET AL 3,412,684

PUMP CASING

Filed July 27, 1967

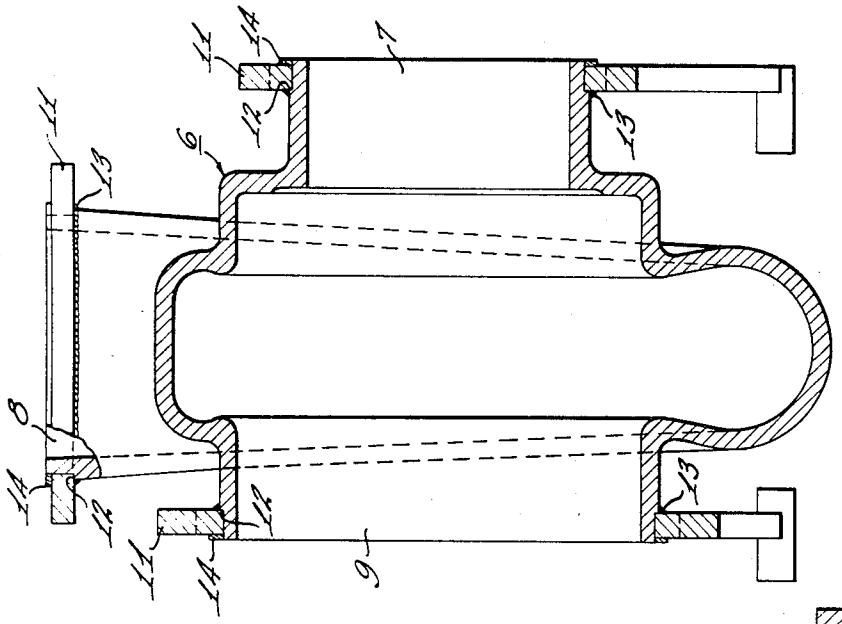


Fig. 2

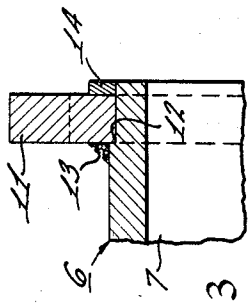


Fig. 3

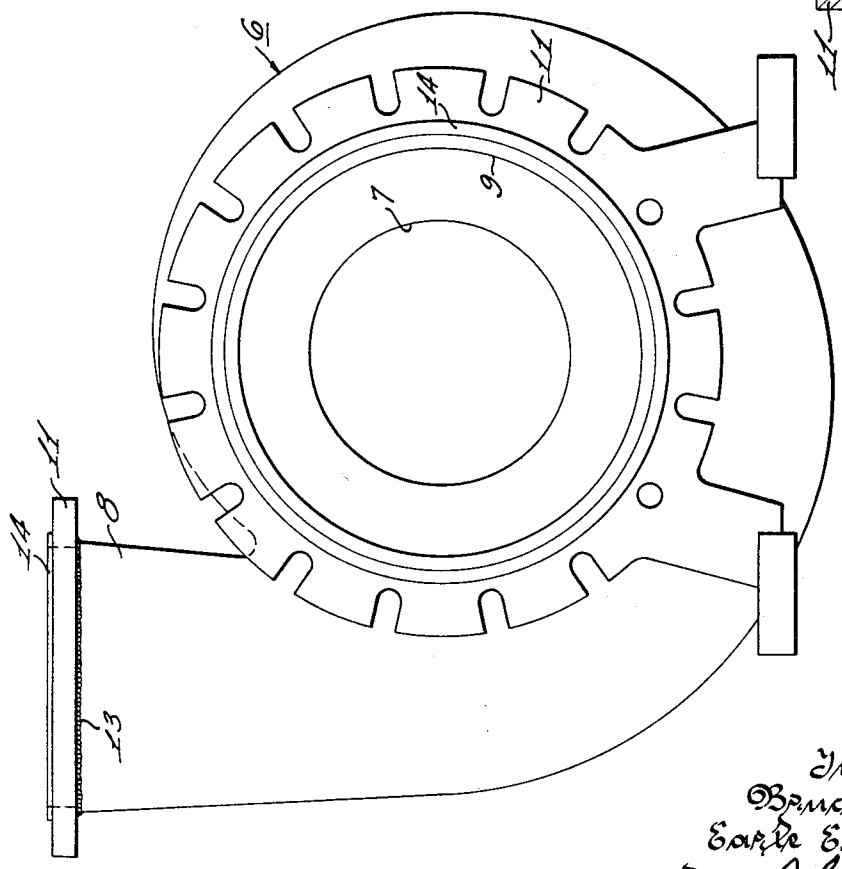


Fig. 1

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United States Patent Office 3,412,684
Patented Nov. 26, 1968



3,412,684

# PUMP CASING

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Filed July 27, 1967, Ser. No. 656,572
2 Claims. (Cl. 103—114)

## ABSTRACT OF THE DISCLOSURE

A pump casing including a portion cast of a corrosive resistant material with the end flanges made of a noncorrosive resistant material. The end flanges are welded to the casting and a corrosive resistant gasket surface is welded to the flange surface.

This invention pertains to pump casings and more particularly to pump casings which are partially cast and partially fabricated and which are likely to be exposed to corrosive materials.

When corrosive material is moved by a pump, it is desirable to line all portions of the pump casing which will be exposed to the material with a corrosive resistant material such as stainless steel. The pump casing in these situations are usually cast from stainless steel including the end flanges. It is necessary to cast the end flanges out of the stainless steel because they provide the gasket surface about the pump inlet and discharge and therefore are exposed to a portion of the corrosive material.

It is the intention and general object of this invention to provide a pump casing for handling a corrosive material wherein the main portion of the pump casing is cast and the end flanges are welded to the cast portion.

A further object of the subject invention is to provide a pump casing of the hereinbefore described type wherein the cast portion is of a corrosive resistant material and the end flanges are constructed of a noncorrosive resistant material.

A more specific object of the subject invention is to provide a pump casing of the hereinbefore described type wherein a corrosive resistant gasket surface is provided on the noncorrosive resistant flange.

These and other objects of the subject invention will be more fully apparent as the following description is read in light of the attached drawing wherein:

FIG. 1 shows an end elevation of a pump casing constructed in accordance with the invention;

FIG. 2 is a partial cross section of the pump casing; and

FIG. 3 is an enlarged view showing the connection of the end flange to the pump casing.

The pump casing shown herein for purposes of illustration is for a centrifugal pump; however, it should be understood this is not intended to limit the invention to this type of pump. The casing includes a main pumping portion **6** having an inlet **7** and a discharge **8** as well as a rear housing portion **9** for the pump shaft bearing and seal. The casing is cast of a noncorrosive material such as stainless steel so that the corrosive material can be pumped without causing excessive damage to the surfaces of the pump to which it is exposed.

Mounting flanges **11** are provided about the pump inlet **7**, the pump discharge **8** and the rear housing **9**. These flanges are to provide mounting surfaces for connecting the inlet and discharge piping as well as the rear cover plate. It should be noted that the portions of the pump casing about which the flanges **11** are mounted extend a short distance beyond the outer surface of the flanges for a purpose which will be explained later. Additionally, a shoulder **12** is machined on the pump casing for locating the flanges. The flanges are then welded at **13** on this



shoulder so that the casing extends a short distance beyond the outer surface of the flanges. This weld is adequate to withstand the forces imposed on the flanges due to the pump mounting.

Each flange is made of noncorrosive resistant steel such as carbon steel thereby resulting in a lower cost for materials. Additionally when the flanges are cast with the casing, a thicker casing wall is required about the flange area due to inherent imperfections in the casting. Since the flanges are not cast with the casing, additional expensive noncorrosive material is saved since the casing wall thickness can be decreased. Furthermore, the casting itself is much easier to accomplish thereby resulting in manufacturing savings.

Although casting the pump casing **6** without the flanges **11** does result in a savings in the cost of the material, as well as in the manufacturing cost of the castings, it does present an additional problem. In order to save on the cost of the expensive noncorrosive material of the casting, the wall thickness of the inlet discharge and rear housing is decreased resulting in an insufficient surface for an adequate seal. As an example, it may be assumed that in order to provide an effective seal about the pump inlet it is necessary to have a gasket surface one inch wide. This is necessary since it cannot be insured that the gasket will effect a seal in a perfect circle. Most likely, the seal will describe an eccentric about the centerline of the pump inlet and the line of this seal might vary in radius as much as one inch. It is therefore necessary to provide a gasket surface which is one inch in width.

By eliminating the flanges as a portion of the casting for the pump inlet, the thickness of the inlet casing wall can as an example be reduced to one-half inch. However, the one-half inch thickness of the casing inlet is not sufficient to provide an adequate sealing surface. Furthermore, since the flange is now constructed of a low cost carbon steel, it cannot be used as an extension of the gasket surface. This is because some of the corrosive material being pumped would come in contact with the carbon steel if the one inch surface is in fact necessary to an adequate seal.

To overcome this problem, applicants provide an annular surface of stainless steel weld **14** laid over the carbon steel flange against the portion of the pump casing which extends beyond the flanges **11**. This laid on weld when added to the surface of the pump casing provides a gasket surface of the desired width. In this manner a gasket surface of corrosive resistant material can be provided with slight additional cost.

From the above it can be seen that applicants have materially reduced the cost of manufacturing a pump by decreasing the amount of expensive corrosive resistant material utilized as well as substantially reducing the manufacturing costs of the casting required.

Although only one embodiment of the subject invention has been herein shown and described, other embodiments will be obvious to those skilled in the art after reading this description and it is intended that all such embodiments as come within a reasonable interpretation of the appended claims be covered.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

**1.** A casing comprising: a main portion including walls defining an inlet opening and a discharge opening, said main portion being a casting of corrosive resistant material; mounting flanges connected to said main portion about the outer peripheral walls of said inlet and discharge openings, said flanges being of a noncorrosive resistant material; and a corrosive resistant weld material laid on said flanges and cooperating with said inlet and discharge walls to provide a gasket surface of sufficient width to provide an adequate sealing surface.

2. The casing set forth in claim 1 wherein the walls of said inlet and discharge openings extend beyond the outer surface of said flanges and said corrosive resistant weld material is laid on said flanges in abutting relation to said walls.


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