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71 Applicant: Hammond Engineering Limited
 38 Chase Side
 Enfield Middlesex EN2 6NG(GB)

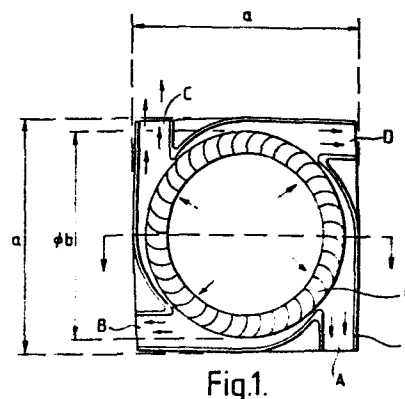
72 Inventor: Fisher, Dudley John
 3/4 Stud Gate Cottages Burnet Farm Ride
 Enfield Middlesex(GB)

74 Representative: Saunders, Harry
 SAUNDERS & DOLLEYMORE 2 Norfolk Road
 Rickmansworth Hertfordshire WD3 1JH(GB)

54 A fan casing, a fan, and a device comprising the fan.

57 The fan casing has more than one outlet (A-D), preferably two or four outlets. The casing is of a substantially square-shaped outline and the outlets are situated in the corners thereof.

The fan has an impeller (5) and comprises the casing, in which the length (a) of one side of the casing is less than 15% larger than the diameter (b) of the impeller.



-1-

A FAN CASING, A FAN, AND A DEVICE COMPRISING THE FAN

The invention relates to a fan casing, particularly one to be fitted to a rotary vane air compressor or vacuum pump (hereinafter: compressor),
5 a fan comprising said casing, and a gas-cooled (hereinafter: air-cooled) device having at one or each end thereof said fan.

It is known that a considerable amount of heat is generated as the compressor is operated. It
10 is also known that for continuous high performance of the compressor one way to remove this heat is to use a fan to draw or blow cooling air across the compressor which is finned to assist the cooling. The fans used for this purpose are generally fans
15 consisting of an impeller without any proper casing which would increase the efficiency of the fan. It is known that the efficiency of cooling could be considerably increased by using a centrifugal fan having an impeller rotatably mounted within a scroll-shaped casing associated with the compressor.
20 However fans with such a casing are not used because of the size of the casing needed.

One of the prime parameters of a compressor is its size relative to its output. Important
25 factors of fan performance include the ratio of the outside dimensions of the casing to the diameter of the impeller. The outside dimensions of the casing of a typical known centrifugal fan, i.e. a fan having a single outlet, are at least 60% greater than the
30 diameter of its impeller.

The aim of the invention is to avoid this disadvantage.

This is achieved, according to the invention, by a fan casing having more than one
35 outlet. A preferred embodiment of a casing according

-2-

to the invention has two or four outlets.

The invention will now be described, by way of example, with reference to the accompanying diagrammatic drawing, in which:

5 Figure 1 shows a radial section through a fan, and

Figure 2 is an axial section through the fan shown in Figure 1 attached a compressor.

10 The illustrated fan comprises a scroll-type casing 4 in which is rotatably mounted an impeller 5. As can be seen from Figure 1 the casing 4 has a substantially square-shaped outline and has four outlets A, B, C, D spaced through 90° from each other. This configuration of the casing 4 results in
15 an overall dimension a of the casing 4 being less than 15% larger than the diameter b of the impeller 5, so that, for a given overall size a, the air throughput is increased because a larger diameter impeller 5 may be used with a casing 4 according to
20 the invention than could be used with the known casing having the usual single large outlet.

Figure 2 shows a compressor 1 provided with fins 2 and 3. To the illustrated end of the compressor 1 is attached the fan shown in Figure 1,
25 which has an end cover 6 and the impeller 5 of which is carried by a shaft 7. In the illustrated embodiment both the fan and the compressor 1 have a common shaft 7, which protrudes from the compressor 1 at the other, non-illustrated end thereof and is
30 there driven in a manner known per se e.g. by an electric motor.

In a preferred embodiment the compressor 1 will have one fan according to the invention attached at one end and another at the other end, and the
35 compressor 1 and both the fans will have a common

-3-

shaft 7 which will pass through the end cover 6 of one of the fans, and the whole assembly of the two fans and compressor 1 will be driven as mentioned above.

5 As is shown by the arrows in Figure 2, air is drawn by the impeller 5 across the fins 2 and 3 of the compressor 1, which is thereby cooled, and the air is then expelled through the four outlets A-D in the casing 4 shown in Figure 1.

10 It will be appreciated that the length of the lateral walls of the casing 4 will be adapted to the length of the compressor 1 so as to force the cooling air to flow across a greater area of the fins 2 than is shown. Naturally, better cooling is
15 achieved by using two fans as explained above. It will also be appreciated that the casing 4 of the fan need not have four outlets but may have only two outlets or any other number of outlets greater than one depending on the cross-sectional shape of the
20 casing 4 desirable for any particular application.

-4-

CLAIMS

1. A fan casing, characterised in that it has more than one outlet (A-D).
2. A casing according to Claim 1,
5 characterised in that it has two or four outlets (A-D).
3. A casing according to Claim 1 or 2, characterised in that it is of a substantially square-shaped outline, and the outlets (A-D) are
10 situated in the corners thereof.
4. A fan comprising a casing, an impeller situated in the casing, and a shaft carrying the impeller, characterised in that the casing (4) has more than one outlet (A-D).
- 15 5. A fan according to Claim 4, characterised in that the casing (4) has two or four outlets (A-D).
6. A fan according to Claim 4 or 5, characterised in that the casing (4) is of a
20 substantially square-shaped outline, and the outlets (A-D) are situated in the corners thereof.
7. A fan according to Claim 6, characterised in that the length (a) of one side of said
25 substantially square-shaped outline of the casing (4) is less than 15% larger than the diameter (b) of the impeller (5).
8. An air-cooled device characterised in that it comprises at one or each end thereof a fan according to any one of Claims 4 to 7.
- 30 9. A device according to Claim 8, characterised in that the device has a shaft connected to, or integral with, the shaft (7) of the fan, or at least one of the fans.

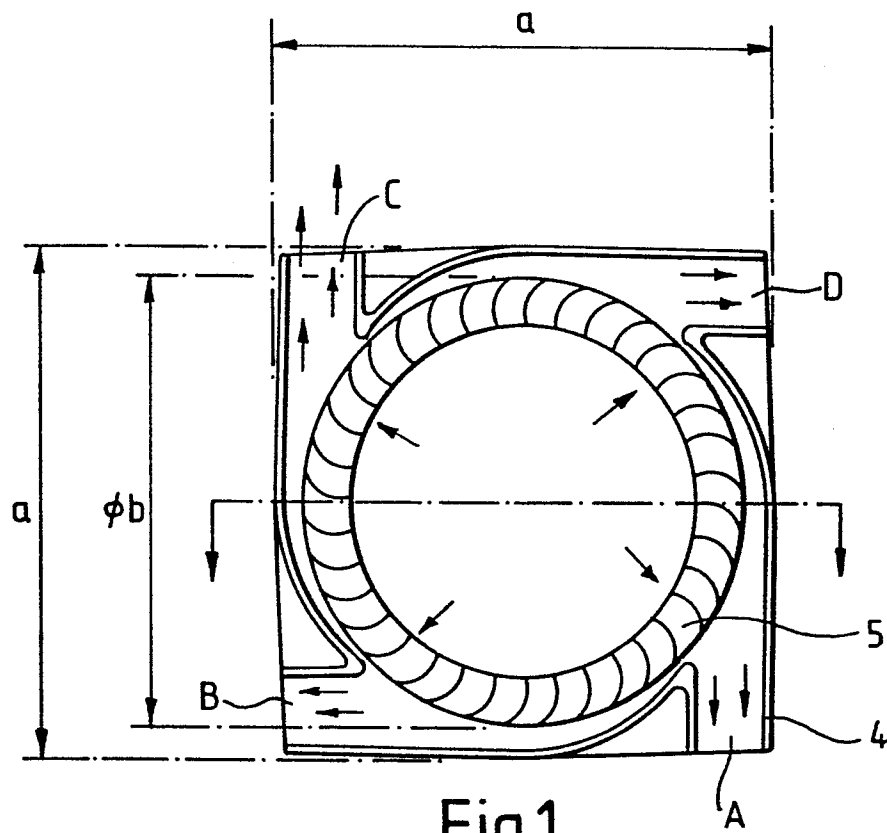


Fig.1.

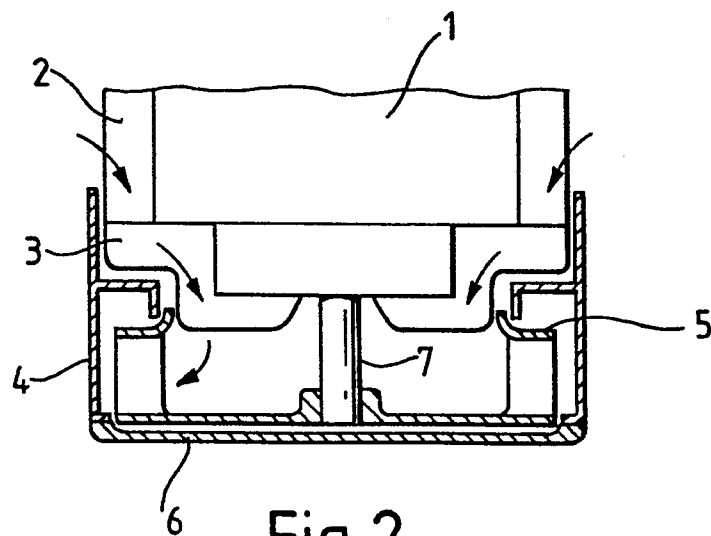


Fig.2.



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	US-A-3 950 112 (CRUMP) * Column 8, lines 15-27; figures 6,7 *	1-6	F 04 D 29/42 F 04 D 25/16
A	--- GB-A-2 006 339 (DEERE AND COMPANY) * Page 1, lines 57-63; figure 1 * -----	8,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			F 04 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15-07-1983	Examiner WOOD R.S.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	