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CENTRIFUGAL FAN

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FIG. 1.

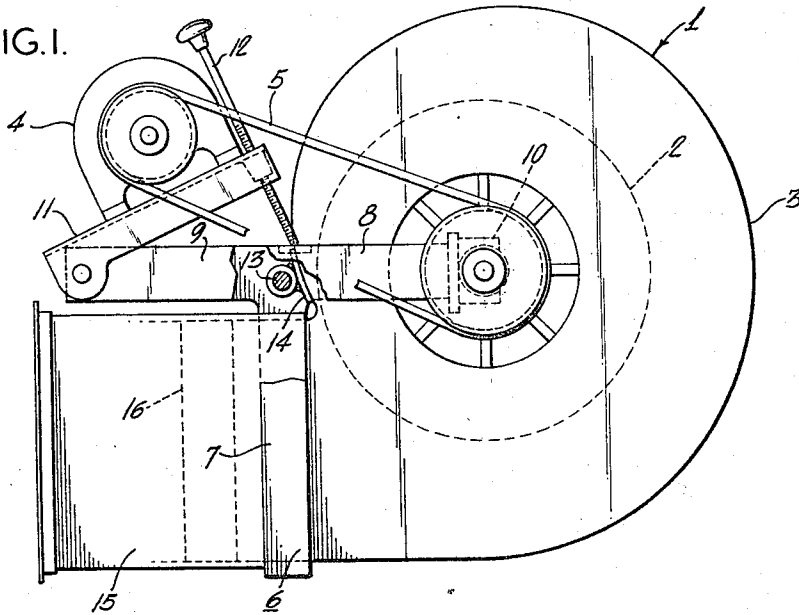
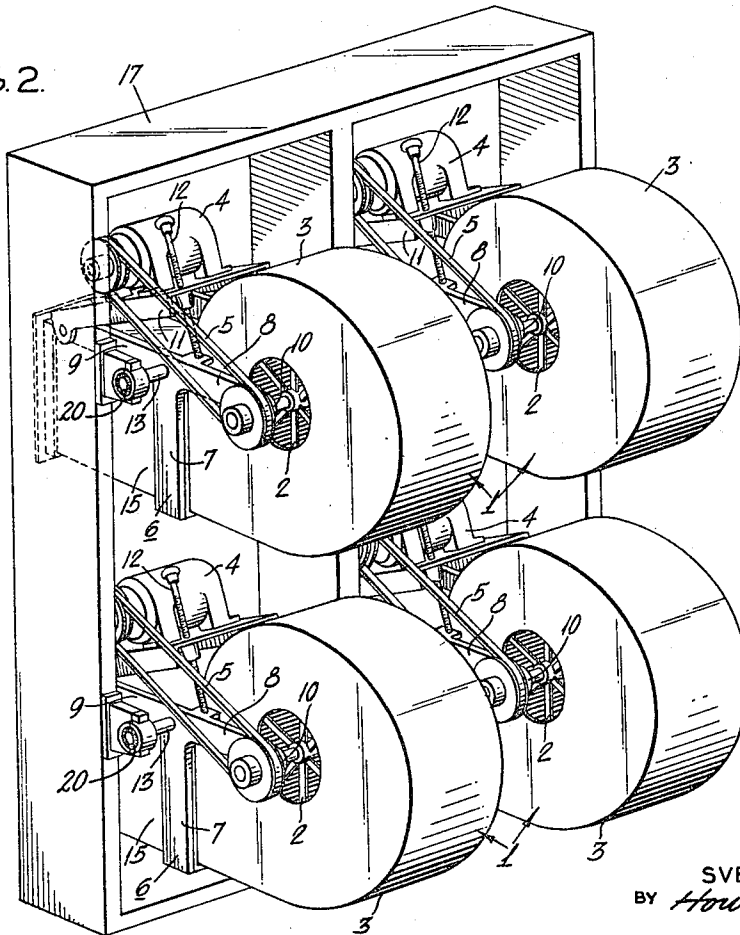


FIG. 2.



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1

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CENTRIFUGAL FAN

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6 Claims. (Cl. 230—117)

ABSTRACT OF THE DISCLOSURE

A multiple fan unit wherein each fan is mounted on a common stand by a support structure surrounding the outlet opening of the spiral housing. This support structure provides a connecting flange for the outlet and is provided with oppositely directed arms supporting respectively the fan wheel within the housing and the motor exterior of the housing. The pins mounting the frame on the stand are approximately on the axis of the center of gravity of the fan assembly and are provided with vibration-damping means.

The present invention relates to a centrifugal fan which is constructed in a novel and expedient way and thereby eliminates the disadvantages involved with previously known conventional embodiments. The invention, thus constitutes a new development with respect to the support of both the rotary parts of the fan and the motor used, as well as a relief of the effect of belt tension upon the helical fan housing.

A centrifugal fan according to the invention comprises a rotatably mounted fan wheel, a helical housing enclosing the fan wheel and a drive motor with associated belt drive. The fan is characterized in that the outlet flange of the fan is designed as a separate frame with two opposite side pieces which are braced for serving as the only supporting members of the fan, said side pieces being provided with arms projecting into opposite directions and carrying the bearings of the fan wheel and the drive motor respectively. Contrary to previous embodiments of centrifugal fans wherein the shaft of the fan wheel is mounted on arms or bearing blocks connected to and supported by the helical housing, the fan wheel as well as the drive motor with its tension bridge, thus, rest upon the outlet flange of the fan which is the only supporting member of the fan. By the present invention, it is possible to construct the housing of a thin material because the housing is entirely relieved from both weights and tensions.

An expedient embodiment of the centrifugal fan is characterized in that each of the braced side pieces is provided with a projecting pin for suspending the fan in a stand, said pins being disposed between the motor and the fan wheel bearings approximately on the axis through the center of gravity of the fan unit. Hereby, the entire unit substantially can be supported in only two points, which also allows for a simpler way of vibration damping. By constructing the centrifugal fan according to above and providing it with a self-closing check valve, the individual centrifugal fans can be assembled to a unit of optional size. For this purpose the fan units, according to a further embodiment, can be suspended in and connected to a common stand or a wall in a building.

The invention will now be described in a greater detail in the following with reference to the accompanying drawings wherein

FIG. 1 shows in side elevation a centrifugal fan constructed according to the invention, and

FIG. 2 shows in perspective a greater unit assembled of a number of fan assemblies operating in parallel.

Referring to the figures, a centrifugal fan 1 comprising a rotatably mounted fan wheel 2 and an associated

2

helical housing 3, has a drive motor 4, and the associated belt drive 5. According to the invention, the outlet flange of the fan is designed as a separate frame 6 with two opposite side pieces 7 which are braced to serve as the only supporting members of the fan. The frame is provided with arms 8 and 9 projecting into opposite directions, and which carry the fan wheel bearings 10 and the drive motor 4 respectively. In the embodiment shown, the drive motor is placed on a pivotal bridge 11 adapted to be adjusted by a screw spindle 12. Each of the braced side pieces is provided with a projecting pin 13, which pins can be designed as an integral element spanning the side pieces 7 and carrying a curved plate 14 to which the helical plate of the fan housing 3 is connected. An outlet connecting piece 15 is assembled with the outlet flange 6, in which connecting piece one or more self-closing check valves 16 are arranged. In FIG. 2, a multiple-fan unit is shown, having a stand 17 common to a plurality of fan assemblies operating in parallel. As shown, this stand supports all of the fan assemblies by connections to the pins 13 which have vibration-damping means provided thereon as indicated at 20.

What is claimed is:

1. For a centrifugal fan assembly comprising a fan wheel, a drive shaft supporting said wheel, a helical housing surrounding the fan wheel and having an air inlet opening into the center of said wheel and an air outlet opening from the periphery of said wheel at one side, bearing means supporting said drive shaft at its ends for rotation, an electric motor for driving the drive shaft mounted at said one side of the housing, and drive means connecting the motor and the drive shaft; the improvement including a separate supporting frame surrounding the air outlet opening of the housing, and providing a connecting flange for the outlet, and having two opposite side pieces braced to serve as the only supporting structure of the fan assembly, said side pieces being positioned intermediate said drive shaft and said motor and having arms projecting in opposite directions from said braced side pieces, the arms projecting in one direction supporting the bearing means for the drive shaft, and the oppositely-projecting arms supporting the electric motor.

2. A centrifugal fan according to claim 1 wherein each of the braced side pieces of the supporting frame structure is provided with an outwardly projecting pin for suspending the fan, said pin being located between the motor and the bearing means for the drive shaft approximately on the axis through the center of gravity of the fan assembly.

3. A centrifugal fan according to claim 2 wherein said pins are integral parts of an element interconnecting said braced side pieces, the helical housing being supported on said element intermediate said side pieces.

4. A centrifugal fan according to claim 2 including vibration-damping means on said pins.

5. A centrifugal fan according to claim 1 wherein an outlet duct piece having at least one self-closing check valve therein is connected to the connecting flange.

6. A fan unit comprising a plurality of centrifugal fan assemblies according to claim 1 operating in parallel, and a common stand supporting all of said fan assemblies by connections to their respective separate supporting frames.

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