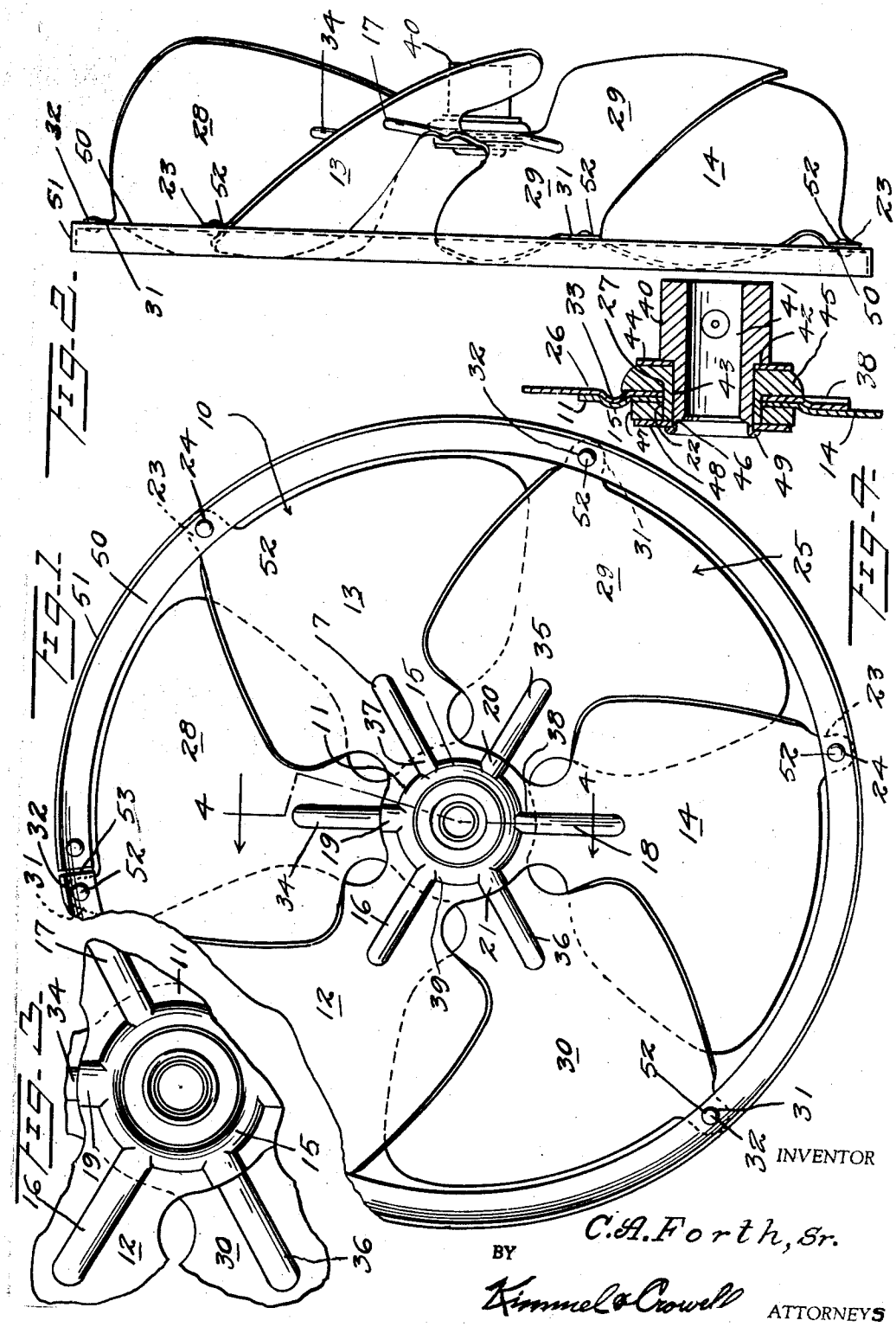
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RESILIENTLY MOUNTED IMPELLER BLADES

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RESILIENTLY MOUNTED IMPELLER BLADES

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The present invention relates to impeller blades, and more particularly, to impeller blades of the axial flow type.

The primary object of the invention is to provide an axial flow impeller having a plurality of blades centrally mounted to a vibrationless hub.

Another object of the invention is to provide an impeller of the axial flow type having a pair of blade carrying members locked to a centrally vibrationless hub.

A further object of the invention is to provide an interlocking structure for impeller blade members of the class described above which will restrain the members against radial movement with relation to a vibrationless hub.

A still further object of the invention is to provide a multi-bladed impeller of the class described above which will be inexpensive to manufacture, quiet in use, and simple to maintain.

Other objects and advantages will become apparent from the following specification when considered in the light of the attached drawings, in which:

Figure 1 is a front elevation of the impeller embodying the present invention with parts broken away.

Figure 2 is a side elevation of the invention.

Figure 3 is a fragmentary enlarged front elevation of the hub structure of the impeller.

Figure 4 is an enlarged detailed vertical cross-section taken along the line 4—4 of Figure 1, looking in the direction of the arrows.

Referring now to the drawings in detail wherein like reference numerals indicate like parts throughout the several figures, the reference numeral **10** indicates generally a blade member comprising a central hub portion **11**, and a plurality of equispaced radially extending blades **12**, **13** and **14**. The hub portion **11** is provided with a circular embossed groove **15** which is positioned axially of the hub **11** and has extending outwardly therefrom a radial groove **16** which is formed similarly to the circular groove **15** and extends into the blade **12**. A radial groove **17** also communicates with the groove **15** and extends into the blade **13**, while a groove **18** is similarly connected to the groove **15** and extends into the blade **14**.

Centrally positioned between each of the radial grooves **16**, **17** and **18** are short grooves **19**, **20** and **21**, respectively, which communicate with the circular groove **15** and extend to the edge of the hub **11**. The hub **11** of the blade member **10** is provided with a central bore **22**, the purpose of which will be explained.

Each of the blades **12**, **13** and **14** are provided with an outwardly projecting ear **23** having an orifice **24** formed therein. A second blade carrying member, generally indicated at **25**, is likewise provided with a hub **26** having a central bore **27** therein. A plurality of blades **28**, **29** and **30** extend outwardly from the hub **26** in a radial direction and are provided at their outer edges with ears **31** having orifices **32** formed therein.

A circular groove **33** is formed axially of the hub **26** of the same size as the circular groove **15** and is formed

so as to interfit the groove **15** when the blade carrying members **10** and **25** are brought into overlying position as illustrated in Figure 4.

The blade **28** has a radial groove **34** extending radially inwardly thereon to communicate with the groove **33**. The blade **29** has a radially extending groove **35** communicating with the groove **33**, while the blade **30** has a groove **36** formed therein to extend to the groove **33**. Midway between the radial grooves **34**, **35** and **36**, the hub **26** is provided with short grooves **37**, **38** and **39** extending radially outwardly so as to align with the radial grooves **16**, **17** and **18**, respectively, on the blade carrying member **10**. The short grooves **19**, **20** and **21** on the hub **11** overlie the inner ends of the grooves **34**, **35** and **36** on the blade carrying member **25** so as to interfit as illustrated in Figure 4. Obviously, the formation of the hubs **11** and **26** are such that no radial movement can occur between the blade carrying members **10** and **25**.

A hub **40** having a bore **41** extending axially therethrough is provided with a shoulder **42** and a reduced portion **43** extending therefrom. An annular washer **44** is positioned adjacent the shoulder **42** and has a rubber mounting block **45** positioned thereagainst and against the reduced portion **43**. A tubular extension **46** extends outwardly from the block **45** and forms a cylindrical mounting portion for the blade carrying members **10** and **25**.

A resilient washer **47** is positioned against the outer face of the blade carrying members **10** and **25** over the tubular extension **46**. A washer **48** is positioned against the outer face of the resilient washer **47** and is adapted to clamp the assembly together. The outer end of the hub **40** is swaged at **49** to engage the washer **48** holding the assembled blades onto the hub **40**.

A ring **50** having a cylindrical flange **51** formed thereon is secured to each of the ears **23** and **31** by means of attaching elements **52**. The ring **50** is discontinuous, having a gap at **53** between the ends thereof.

In the use and operation of the invention, the hub **40** is mounted to the shaft of a motor or to any power driven shaft desired with the blades **12**, **13**, **14**, **28**, **29** and **30** extending transversely of the air flow direction. The hubs **11** and **26** of the blade carrying members **10** and **25** are resiliently mounted on the rubber block **45** and are clamped thereon with the resilient washer **47** to provide a vibrationless mounting therefor. Obviously, the blades **12**, **13**, **14**, **28**, **29** and **30** are sloped or twisted about a radial center to produce an air impeller effect.

With the structure described above, it is obvious that the use of rivets and other positive fastening elements between the hubs **11** and **26** are completely eliminated along with their attendant failures.

Having thus described the preferred embodiment of the invention, it should be understood that numerous modifications and structural adaptations may be resorted to without departing from the scope of the appended claims.

What is claimed is:

1. An impeller comprising a hub portion, a plurality of blades extending radially from said hub portion, a second hub portion, a plurality of blades extending radially from said second hub portion, means connecting the outer end edges of each of said blades, and interfitting radially and annularly embossed portions on said hub portions to hold said hub portions against radial and circumferential displacement with respect to each other.

2. A device as claimed in claim 8 wherein said means connecting the outer end edges of said blades comprises

a discontinuous L-shaped ring and fastening elements securing each of said blades to said ring.

3. An impeller comprising a hub adapted to receive a drive shaft, a pair of confronting fan hub portions, means mounting said fan hub portions on said hub, interfitting radially and annularly embossed portions on said hub portions holding said hub portions against radial and circumferential displacement with respect to each other, a plurality of blades extending radially from each of said fan hub portions, a discontinuous ring of L-shaped cross section and means securing the outer end edge of each blade to said ring.

4. An impeller comprising a hub adapted to receive a drive shaft, said hub having a shoulder adjacent one end thereof and a reduced portion extending from said shoulder to said end of said hub, a washer positioned on said reduced portion and engaging said shoulder, a hollow cylindrical resilient mounting block mounted on said reduced portion of said hub, a flange portion formed integrally on said resilient mounting block engaging against said washer, a pair of fan hub portions mounted on said mounting block, a resilient washer surrounding said mounting block, said fan hub portions being positioned between said resilient washer and said flange of said mounting block, means mounted on the end of said hub bearing against said resilient washer and holding said fan hub portions together, a plurality of blades extending radially from each of said fan hub portions, each of said fan hub portions having interfitting radially and annularly embossed portions thereon to hold said fan hub portions against radial and circumferential displacement with respect to each other, and a discontinuous ring of L-shaped cross section, the outer edge of each of said blades being secured to said ring.

5. An impeller comprising a plurality of hub portions, a plurality of blades extending radially from each of said hub portions, means connecting the outer end edges of each of said blades and interfitting radially and annularly embossed portions on said hub portions to hold said hub portions against radial and circumferential displacement with respect to each other.

6. An impeller comprising a hub portion, a plurality of blades extending radially from said hub portion, a second hub portion, a plurality of blades extending radially from said second hub portion and interfitting radially and annularly embossed portions on said hub portions to hold said hub portions against radial and circumferential displacement with respect to each other.

7. An impeller comprising a plurality of hub portions, a plurality of blades extending radially from each of said hub portions, and interfitting radially and annularly embossed portions on said hub portions to hold said hub portions against radial and circumferential displacement with respect to each other.

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