Feb. 15, 1955 E. P. TURNER 2,702,214

VACUUM CLEANER HANDLE SECURING MEANS

Original Filed Nov. 5, 1947

Fig. 1.

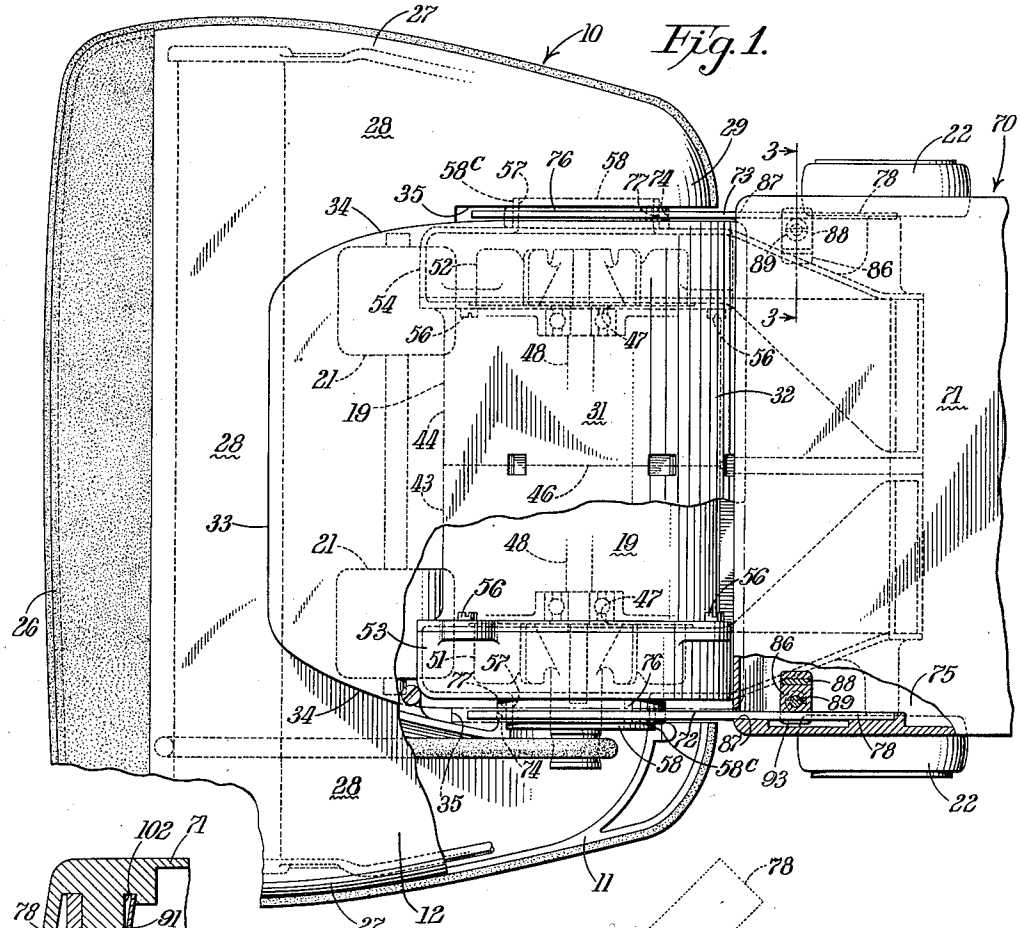


Fig. 3.

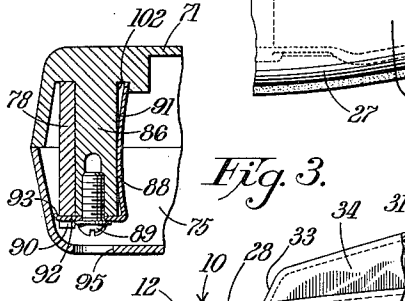


Fig. 2.

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VACUUM CLEANER HANDLE SECURING MEANS

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5 Claims. (Cl. 306—28)

This invention relates to vacuum cleaners and has for its object to provide an improved mounting arrangement whereby the handle of a vacuum cleaner can easily be connected to or disconnected from the body of the cleaner.

The invention consists in the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the accompanying drawings:

Fig. 1 is a plan view of a vacuum cleaner embodying this invention, parts being broken away to show internal construction;

Fig. 2 is a side elevational view of the vacuum cleaner shown in Fig. 1, parts also being broken away; and

Fig. 3 is a sectional view on the line 3—3 of Fig. 1, and shows in detail the means for securing the handle to the trunnion arms.

The instance patent application is a division of my patent application Serial No. 784,167, filed November 5, 1947, now Patent No. 2,633,597.

In the preferred embodiment of the invention illustrated in the drawings, the vcauum cleaner is shown as having an ambulatory casing or chassis **10** formed from a lower chassis shell **11** and an upper chassis shell **12**; the two shells being joined on a line inclined slightly to the horizontal and indicated in Fig. 2 by the numeral **13**. The lower shell **11** is held to the upper shell **12** by a screw **14**.

A combination electric motor and fan unit **19** is supported in the chassis **10** and the vacuum cleaner as a whole is supported on front and rear wheels **21** and **22**.

The upper chassis shell **12** has a front wall **26**, side walls **27**, a top wall **28**, and rear wall portions **29**. Integral with the top wall **28** is a centrally located cupola **31** which extends above the wall **28** and, when the vacuum cleaner is fully assembled, overlies the motor-fan unit **19**. The cupola **31** has a back wall portion **32** which extends a short distance to the rear of the back wall portion **29**. The cupola **31** also has a front wall **33** and a pair of side walls **34**. Adjacent opposite sides of the side walls **34**, the top wall **28** of the upper shell **12** is provided with a pair of long narrow parallel slots **35**, the purpose of which will appear presently, one of the slots **35** being shown in Fig. 1 by dash-dot lines.

The electrical components (not shown) of the motor are housed within two cup-like frame members **43** and **44**, the lip-rim portions of which abut on a plane **46**, which plane is perpendicular to the central axis of the motor-fan unit **19**. This plane **46**, as best seen in Fig. 1, also coincides with the longitudinal center line of the vacuum cleaner. Each of the motor-frame members **43**, **44** is concentrically apertured, as at **47**, for journaling the motor shaft **48**. Impeller fans **51** and **52** are carried by opposite ends of the motor shaft **48**. The fans **51** and **52** are respectively housed in fan casing **53** and **54** held to the respective motor frame members **43** and **44** by screws **56**. Each of the fan casings is apertured by an intake eye **57** and each eye is surrounded by a cylindrical trunnion **58** that is formed integral with its fan casing and extends outwardly therefrom. The trunnions **58**, which are formed on opposite ends of the motor-fan unit **19**, each have an outer cylindrical surface **58c**.

The combination motor-fan unit **19** is primarily supported in the vacuum cleaner chassis **10** by having the

two opposite trunnions **58** clamped between the upper and lower chassis shells **12** and **11**. For a more complete showing of the means for supporting the motor-fan unit **19**, reference may be had to my Patent No. 2,633,597, supra.

In addition to acting as a means for positioning and supporting the combined motor and fan unit **19** in the chassis **10**, the two trunnions **58** provide a means for pivotally mounting a vacuum cleaner handle **70**, only a lower portion of the handle being herein shown. The handle **70** has an inverted box portion **71** having a lower cover **75** secured thereto by a means not herein shown. A pair of flat trunnion arms **72** and **73** are provided and each trunnion arm has an aperture **74** into which is press fitted a bearing bushing **76**, made from a bushing composition and having an internal bearing surface **77**. This surface **77**, in each case, is rotatably positioned on the outer cylindrical surface **58c** of one of the trunnions **58**. Each of the trunnion arms **72** and **73** has an outwardly extending rectangular extension **78** which passes through one of the two slots **35** and thereafter is secured to the box portion **71** of the handle **70**. Each extension **78** is provided on opposite sides thereof with a pair of shoulders **80** which engage the box **71** and cover **75** thereby properly positioning the handle **70** with respect to the chassis **10**. The means for securing the handle **70** to the extensions **78** includes a pair of posts **86** that are formed integral with and extend outwardly from the inner surface of the box **71**. Each of the extensions **78** of the arms **72**, **73** passes through an aperture **87** formed in the lower end of the handle **70** and is clamped to one of the posts **86** by means of an L-shaped clip **88**. One leg **91** of the L-shaped clip **88** has its longitudinal dimension bent, that is to say, the leg **91** is bent about an axis positioned transversely to its longest dimension. This leg **91**, when in position, is adjacent one side of the post **86**, with one end of the leg entering a recess **102** formed in the box **71**. The other leg **92**, of the clip **88**, passes over the end of the post **86** and is held thereto by a headed screw **89**. The leg **92** extends beyond the post **86** and thereby enters an appropriately sized notch **90** formed on one side of the extension **78**. The leg **92** after it passes beyond the member **78** is formed with a small bent over portion or hook **93** which engages the extension **78** thereby holding the extension **78** adjacent the side of the post **86** which is remote from the side thereof which is adjacent the leg **91** of the clip **88**. As the handle **70** is raised and lowered, the composition bushings **76** and the trunnion arms **72**, **73** rotate as a unit with respect to the trunnions **58**.

From the foregoing, it will be noted that this invention has provided a vacuum cleaner that is compact and sturdily constructed, and in which means have been provided whereby the handle **70** can be detached quickly and easily from the trunnion arms **72–73**. In the event that it becomes desirable to detach the handle **70** from the main vacuum cleaner casing or chassis **10**, it is simply necessary to invert the vacuum cleaner including the chassis **10** and handle **70**. Then the two screws **89**, which of course had previously been screwed tight so as to stress the spring clips **88** and cause the hooks **93** to enter the notches **90**, are loosened by a screw driver that may engage the heads of the screws by passing through the holes **95** provided in the cover **75**. Loosening the two screws **89** will relax the clips **88** which thereby move the hooks **93** out of the notches **90** and permits the handle **70** to be detached from the trunnion arms **72** and **73**.

The term "trunnion," as herein used, refers to the two opposite cylindrical projections or similar structures **58** formed on opposite sides of the motor-fan unit **19**. The term "trunnion" is not intended to convey the idea that the motor-fan unit turns on the trunnions as an axis. The trunnion arms **72** and **73** rotate with respect to the trunnions, but in the preferred form of construction there is no relative rotary motion between the trunnions and the chassis shells **11** and **12**.

Having thus set forth the nature of the invention, what I claim herein is:

1. Means for connecting two elements of a vacuum cleaner, one element comprising an arm and the other

element comprising a box having an aperture for receiving said arm; said connecting means comprising, a post located within and secured to the inside of said box adjacent to said aperture, said post having a free end provided with an axially extending internally threaded hole; a spring clip having two legs at right angles to each other, one leg being positioned adjacent to one side of said post, and the second leg being apertured; a hook formed on the free end of said second leg; and a screw passing through said apertured leg and entering said threaded hole in said post, said hook engaging said arm and thereby holding said arm adjacent to the side of said post.

2. Means for connecting two elements of a vacuum cleaner, one element comprising a rectangular arm provided with a notch and the other element comprising a box having an aperture for receiving said arm; said connecting means comprising, a post located within and secured to the inside of said box adjacent to said aperture, said post having a free end provided with an axially extending internally threaded hole; a spring clip having two legs at right angles to each other, one leg being positioned adjacent to one side of said post, and the second leg being apertured; a hook formed on the free end of said second leg; and a screw passing through said apertured second leg and entering said threaded hole in said post, said hook engaging said arm and entering said notch, thereby holding said arm adjacent to the side of said post remote from the side adjacent to said first leg.

3. Means for connecting two elements of a vacuum cleaner, one element comprising a rectangular arm provided with a notch and the other element comprising a box having an aperture for receiving said arm; said connecting means comprising, a post having its base located within and secured to the inside of said box adjacent to said aperture, said base forming with a portion of said box a recess adjacent to said base, and said post having a free end provided with an axially extending internally threaded hole; a clip having two legs at right angles to each other, one leg having an end adapted to fit into said recess adjacent to one side of said post, and the second leg being apertured; a hook formed on the free end of said second leg; and a screw passing through said apertured second leg and entering said threaded hole in said post, said hook engaging said arm and entering said notch, thereby holding said arm adjacent to the side of said post remote from the side adjacent said first leg.

4. Means for connecting two elements of a vacuum cleaner, one element comprising a rectangular arm provided with a notch and the other element comprising a box having an aperture for receiving said arm; said connecting means comprising, a post having its base located within and secured to the inside of said box adjacent to said aperture, said base forming with a portion of said box a recess adjacent to said base, and said post having a free end provided with an axially extending internally threaded hole; an L-shaped spring clip having legs of different lengths, the longer leg being bent about an axis positioned transversely to its length and said longer leg having an end adapted to fit into said recess adjacent to one side of said post, and said shorter leg being apertured; a hook formed on the free end of said shorter leg; and a screw passing through said apertured shorter leg and entering said threaded hole in said post, said hook engaging said arm and entering said notch, thereby holding said arm adjacent to the side of said post remote from the side adjacent said longer leg.

5. Means for connecting two elements of a vacuum cleaner, one element comprising a rectangular arm provided with a notch and the other element comprising a box having an aperture for receiving said arm; said connecting means comprising, a post having its base located within and secured to the inside of said box adjacent to said aperture, said base forming with a portion of said box a recess adjacent to said base, and said post having a free end provided with an axially extending internally threaded hole; an L-shaped spring clip having legs of different lengths, the longer leg being bent about an axis positioned transversely to its length and said longer leg having an end adapted to fit into said recess adjacent to one side of said post, and said shorter leg being apertured; a hook formed on the free end of said shorter leg; a screw passing through said apertured shorter leg and entering said threaded hole in said post, said hook engaging said arm and entering said notch, thereby holding said arm adjacent to the side of said post remote from the side adjacent said longer leg; and a cover for said box, said cover having a hole permitting access to said screw while said cover is covering said box.

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