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Tanaka et al.

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[54] **ELECTRIC HAIR DRYER WITH SPRAY**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **132/9**
[51] **Int. Cl.** **A45d 1/00**
[58] **Field of Search** 132/9, 11, 148, 118; 34/97; 239/357; 222/130, 193

[56] **References Cited**

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[57] **ABSTRACT**

An electric hair dryer having a hair moistening spray means of which hot-air outlet and water spray nozzle are proximate and air blowing and water spray directions are substantially coincided is provided. Water spray unit is separately assembled from dryer unit and mounted adjacent the hot-air outlet so that operating means for the spray will be disposed adjacent control means in the dryer unit for allowing one-hand operation. Water tank for supplying water to the spray unit is detachably mounted to the spray unit through a water-tight sealing means.

1 Claim, 6 Drawing Figures

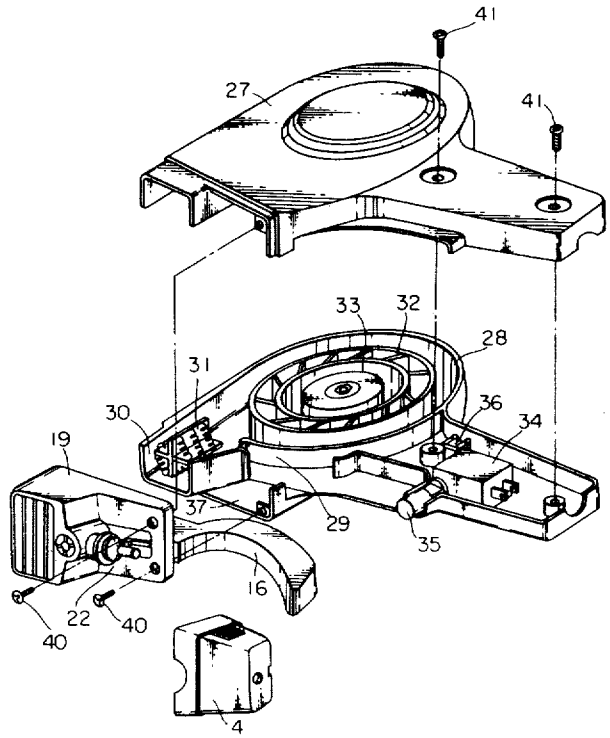


Fig. 1

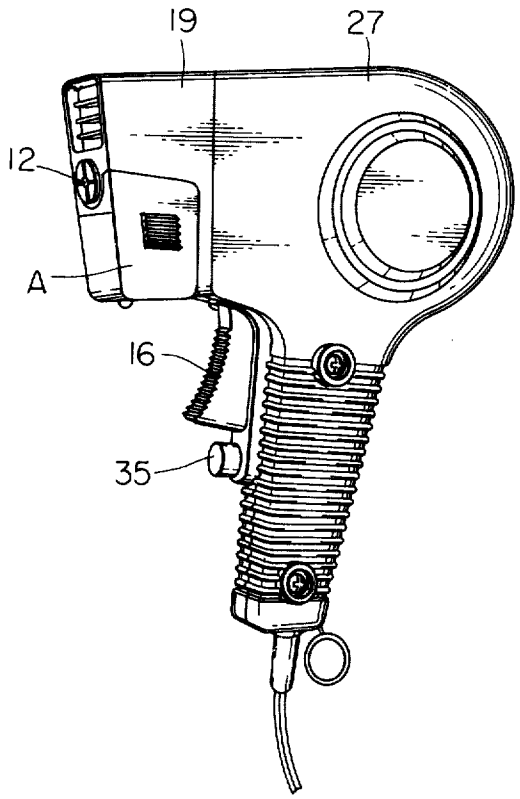
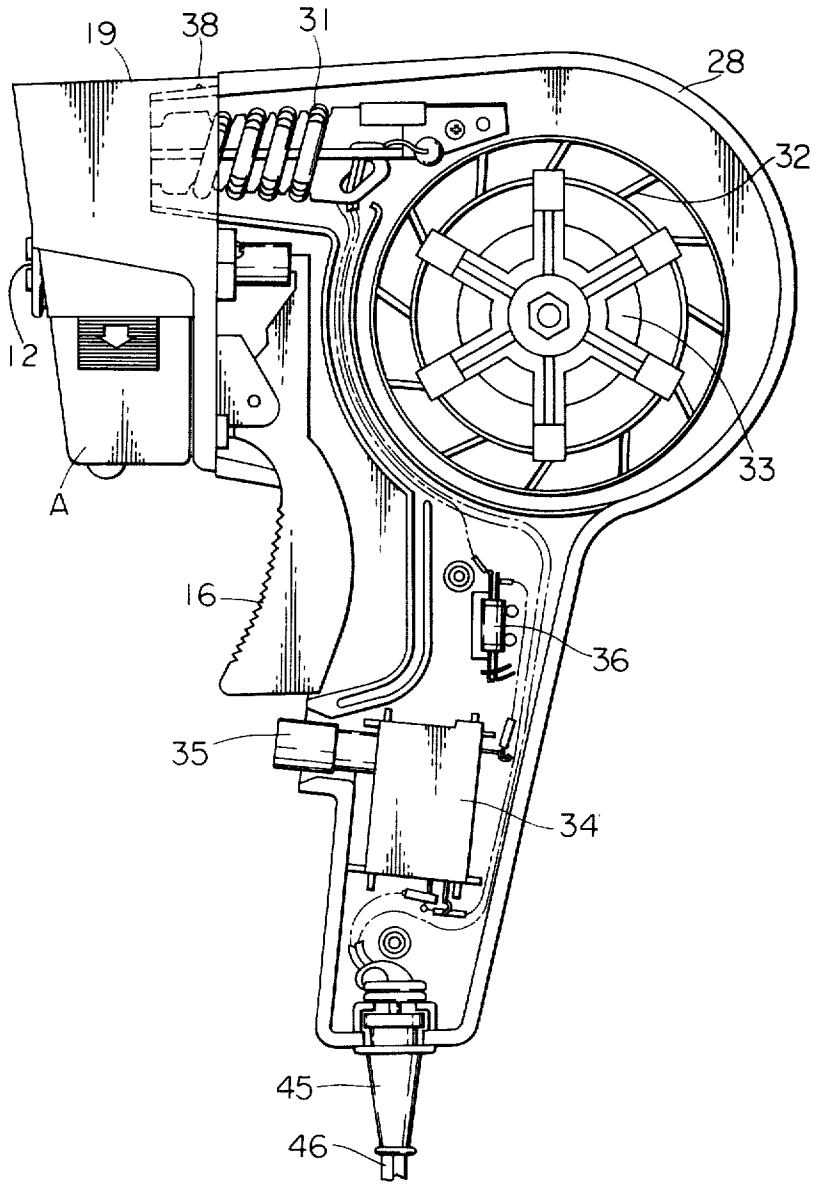


Fig. 2



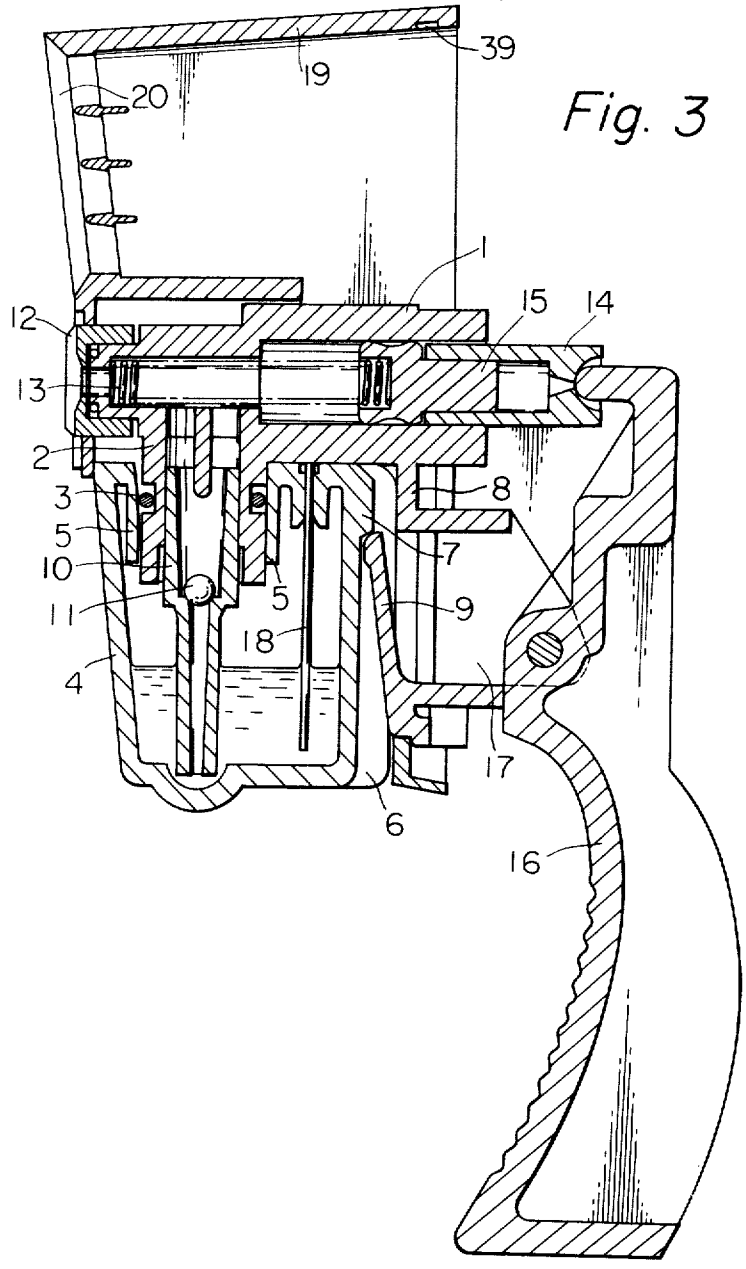


Fig. 3

Fig. 4

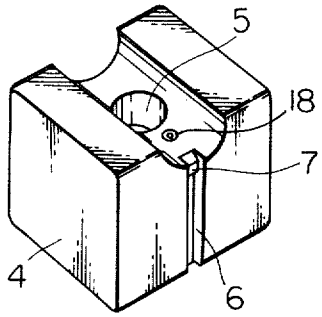


Fig. 5

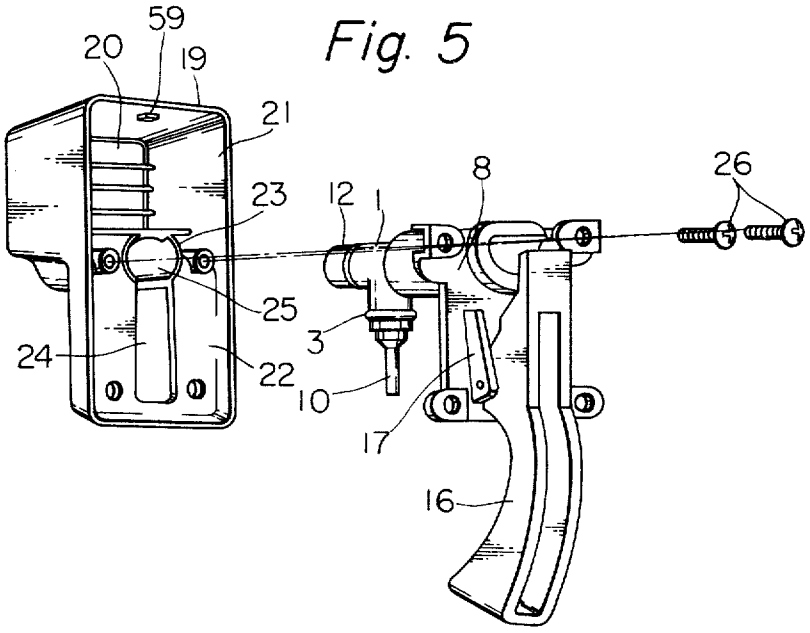
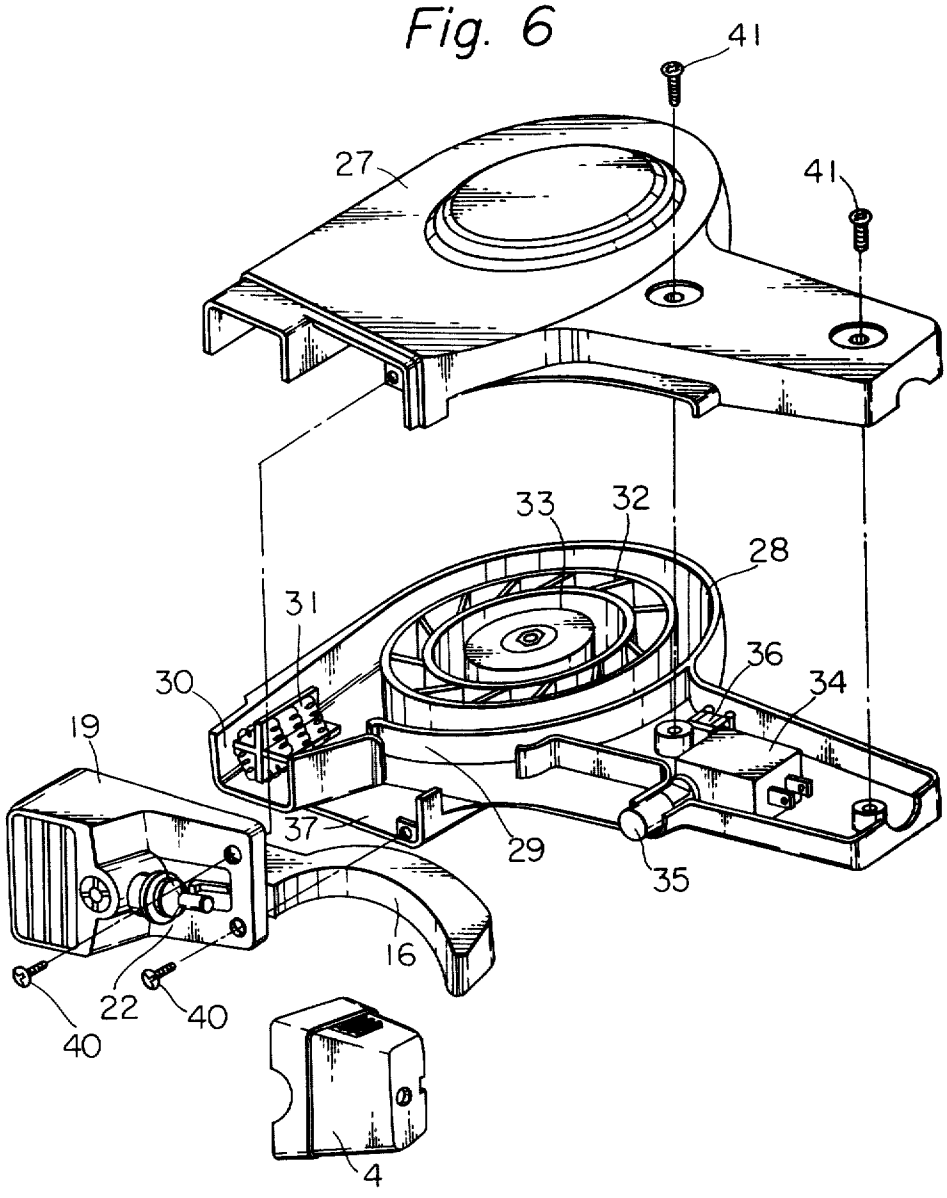


Fig. 6



ELECTRIC HAIR DRYER WITH SPRAY

This invention relates to electric hair dryers having a spray for moistening hairs.

In conventional hair dryers with the spray of this kind, water straying nozzle and hot air outlet are disposed so as not to proximate to each other and, unless the dryer device is removed at each time of moistening and drying, spray applying position and hot air applying position on the user's hair cannot be coincided and thereby the use is caused to be inconvenient. Further, required changeover of the dryer's use between the water spraying and the hair drying can be enabled only when the user re-holds the device to gain access to one of spray actuating lever and dryer actuating lever on the like in stead of the other. Therefore, the dryers of the ring referred to have been inconvenient in that the hot air drying operation has had to be performed after the user once changed his holding posture of the device subsequent to initially performed hair moistening operation by means of the water spray.

The present invention is suggested to eliminate the above mentioned defects of the conventional devices.

A principal object of the present invention is therefore to provide an electric hair dryer having a water spray, wherein a spray unit including a spray nozzle disposed horizontally in general in the upper part is provided fixedly substantially below the hot air outlet so that the hot air outlet and spray outlet are so to be adjacent to each other in the same direction so as to render the hair dryer to be very convenient in the practical use.

Another object of the present invention is to provide a hair dryer having the spray wherein the spray operating handle or lever and dryer operating lever or button are disposed to proximate relation to each other so that the dryer can be operated with one hand and the hair style setting can be performed without removing the dryer device with respect to desired hair portion.

A further object of the present invention is to provide a hair dryer having the spray means wherein a spray unit is made to be a block independent of the dryer unit so as to be easy to assemble and to be particularly easy to have the quality guaranteed.

Another object of the present invention is to provide a hair dryer having the spray wherein the waterproof structure of the spray part, in particular water tank, is perfect.

Other objects and effects of the present invention will be able to be easily understood from the description detailed in the following with reference to accompanying drawings, in which:

FIG. 1 is a perspective view of an embodiment as assembled of the hair dryer having a water spray according to the present invention;

FIG. 2 is a side elevation showing arrangement of component parts within the hair dryer of FIG. 1 with one half body cover removed;

FIG. 3 is a vertically sectioned view of water spray unit in the dryer of FIG. 1 in an enlarged scale to show its structure;

FIG. 4 is a perspective view of water tank in the spray unit of FIG. 3;

FIG. 5 is a perspective view of the spray unit as disassembled into main parts with the water tank removed; and

FIG. 6 is a perspective view of the hair dryer of FIG. 1 as disassembled.

Referring to FIG. 1, A is a spray unit, 12 is a spray nozzle, 19 is a mouthpiece of hot-air outlet, 27 is one half of dryer unit cover, 16 is a spray operating lever and 35 is a hair dryer operating button.

In FIG. 2 showing the arrangement of component parts within the dryer unit with the one half cover member 27 removed, A is the spray unit, 19 is the mouthpiece, 28 is the other one half cover member, 31 is a heater, 33 is a motor, 32 is a fan, 44 is a selenium rectifier, 34 is a switch unit, 35 is the operating button for the switch, 16 is the spray operating lever, 45 is a bushing and 46 is a power source cord.

Referring now to FIG. 3, a cylindrical projection 2 is provided to project downward at right angles to the lengthwise axis direction from a spray cylinder 1 and the cyliner 1 and the interior of the projection 2 communicate with each other. 3 is an O-ring preferably made of a resilient material and fitted in a groove made circumferentially outside the lower part of the projection 2, and 4 is a water tank which is preferably made of a synthetic resin, in which a cylindrical projection 5 is formed so as to project inward from the upper surface as preferably tapered to have gradually reduced diameter so that the O-ring 3 will be pressed against inner periphery of the projection 5 of the water tank to perform close contact therewith. Further, a groove 6 is made vertically, as shown in FIG. 4, on the outside surface of one side wall of the water tank 4 and an outward tapered engaging step 7 is made in the upper part of said groove 6. 18 is an orifice for a pipe to take air into the water tank.

A holding frame 8 is formed integrally with the cylinder 1 in the rear part of it and is arranged substantially at right angles with the axis of the cylinder 1. A resilient pawl 9 is provided substantially in the middle of said holding frame 8, which is formed integrally at the lower part thereof with the holding frame 8 and resiliently projects at the tip on the water tank 4 side. 10 is a suction tube having a check valve 11 and has the upper outside wall pressed and tightly fixed in the projection 2 of the cylinder 1.

In fitting the water tank 4 to the cylinder 1, the water tank 4 is pushed up along the holding frame 8, then the water tank 4 will move upward as guided by the pawl 9 integral with the holding frame while the groove 6 of the water tank is engaged with said pawl 9 and the cylindrical projection 5 of the water tank will be fitted onto the projection 2 of the cylinder so that the O-ring 3 will be tightly in close contact with the inside wall of the cylindrical projection 5 of the water tank, the pawl 9 of the holding frame will resiliently receive the step 7 of the groove 6 of the water tank and thus the water tank 4 will be held by the cylinder 1.

In removing the water tank 4 from the cylinder 1 for supplying water, the water tank 4 should be pulled down as held on both sides. The pawl 9 will then resiliently retreat to the side of the holding frame 8 by being pushed by the step 7 in the upper part so that the engagement of the pawl 9 with the groove 6 will become loose and, therefore, when the tank 4 is further pulled down, the cylindrical projection 5 of the water tank will come off the projection 2 of the cylinder 1.

12 is a nozzle fitted to the head of the cylinder 1. 13 is a spring fitted in the cylinder, 14 is a piston, 15 is a packing which is slidable within the cylinder, and 16 is

an operating lever for the spray rotatably fitted to a supporting wall **17** provided to the holding frame **8.** A bent part at the tip of this operating lever **16** is engaged with exposed rear end of the piston **14.** The spray unit A is formed as described above.

Referring next to FIG. **5, 19** is a substantially cylindrically formed mouthpiece provided with a hot air outlet **20** in the front upper part. The mouthpiece **19** has a downwardly extending sleeve plate **22** integrally formed in the lower part of a rear opening **21** and a substantially horseshoe-shaped cylinder embracing part **23** formed in the upper bent part of the sleeve plate **22,** so that the cylinder **1** will be inserted and fitted in this embracing part **23.** A vertical through hole **24** provided in the middle of the sleeve plate **22** communicates with a slit **25** in the lower part of the embracing part **23.** The spray unit A is mounted to the dryer body as preliminarily fitted to the mounth piece **19.**

In fitting the spray unit A to the mouthpiece **19,** the cylinder **1** is inserted into the embracing part **23,** so that the nozzle **12** will project slightly out of the front surface of the mouthpiece **19.** At the same time, the projection **2** and suction tube **10** of the cylinder **1** are passed through the vertical through hole **24** in the sleeve plate **24** so as to be exposed out of front surface of the plate and, on the other hand, the holding frame **8** formed integrally with the cylinder will be received in the rear space of the sleeve plate **22.** In this position, the sleeve plate **22** and holding frame **8** are fixed together by means of screws **26.**

In FIG. **6** showing the entire apparatus as disassembled, a partition wall **29** is provided to project in each of the two-split halves **27** and **28** of the dryer body cover so that, in case the two half cover members **27** and **28** are overlapped together, a space to contain the rear part of the spray unit A, in particular the operating lever **16,** will be formed in the front lower part of the cover. The heater block **31** is disposed inside a wind tunnel **30** of the cover member **28** and a blower fan **32** is contained in a blowing chamber disposed inside the tunnel **30** as secured to rotary shaft of the motor **33** fixed in the chamber inside an air intake port of the cover member **28.** Screws **41** are to fix the two cover members **27** and **28** together.

In mounting the spray unit A which is already integral with the mouthpiece **19** to the front surface of the cover members **27** and **28** thus assembled, the operating lever **16** is inserted at its downward tip through an opening **37** provided on the front surface of the assembly of the cover members **27** and **28,** a projection **38** provided on the front surface of the cover members **27** and **28** (see FIG. **2**) is fitted in a resess **39** provided on the inside wall of the mouthpiece **19** (see FIG. **3**) and the sleeve plate **22** of the mouthpiece **19** is fixed to the front surface of the assembled cover members **27** and **28** by means of screws **40.**

The way of using the hair dryer of the present invention shall be explained in the following. When the push-button **35** is pushed, the motor will rotate and hot air will come out through the outlet **20.** Then, keeping water in the water tank **4,** the operating lever **16** is pulled, the tip of the operating lever will push the piston **14** and further the packing **15,** so that the pressure in the cylinder **1** will rise. Therefore, the water contained in the cylinder will be jetted as a spray out of the nozzle **12** at the tip of the cylinder. When the operating lever **16** is released, it will return due to the force of the spring **13** and a negative pressure will be produced within the cylinder **1** and will suck up water in the tank through the suction tube **10.** The ball **11** in the suction tube will act as a chek valve. When water jetted out in the form of a spray as above is blown onto the user's hair and then the hot air is applied to the hair by operating the dryer button **35,** the hair will be reset as moistened with the water spray and, at the same time, will be dried with the hot air so that the hair style setting will be performed much easier by the hair dryer according to the present invention.

What we claim is:

1. An electric hair dryer apparatus comprising:

a dryer unit including a pistol shaped body having a barrel portion and a handle portion disposed at an angle to said barrel portion, said body consisting of two half members that are separable from each other along a longitudinal plane of said body, said body having an air inlet and a hot-air outlet with said hot-air outlet being at the end of said barrel, an air blowing fan and a motor for driving said fan both contained within said body, an electric heater means mounted adjacent said hot-air outlet, trigger means on said handle portion for operating said fan motor and heater to effect the discharge of hot air from said outlet,

a spray unit having a pistol like configuration, said spray unit including a fluid reservoir tank, pump means and a spray nozzle disposed above said tank and respectively forming a barrel portion of said configuration, lever means for operating said pump means to cause fluid in the tank to be discharged from said nozzle and forming a handle portion of said configuration,

a mouthpiece removably coupling the barrel portions of said spray and dryer units with the barrel and handle portions of said spray unit in closely adjacent relation to the respective barrel and handle portions of said dryer unit, said spray unit lever means being located immediately adjacent said dryer unit trigger means, said lever means and trigger means being on a common side of said dryer unit handle portion, said sprayer unit nozzle and dryer unit outlet causing fluid spray and hot air respectively to be emitted from said apparatus in a common direction, and

said dryer unit body being formed with a pawl for resiliently engaging and supporting said reservoir tank in operative relation below said spray unit nozzle and pump means, and said tank being selectively removeable from said spray unit without uncoupling said dryer unit and said spray unit from said mouthpiece.

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