Sept. 14, 1965 N. J. PALUMBO ETAL 3,205,610

PNEUMATIC TOY STOVE AND ACCESSORIES

Filed Dec. 1, 1964 2 Sheets-Sheet 1

FIG. 1

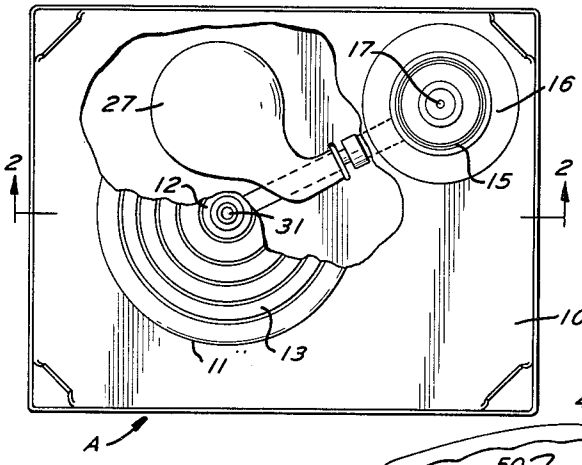


FIG. 3

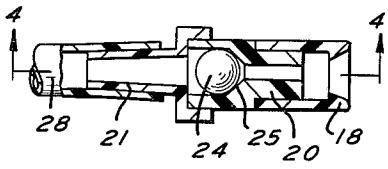
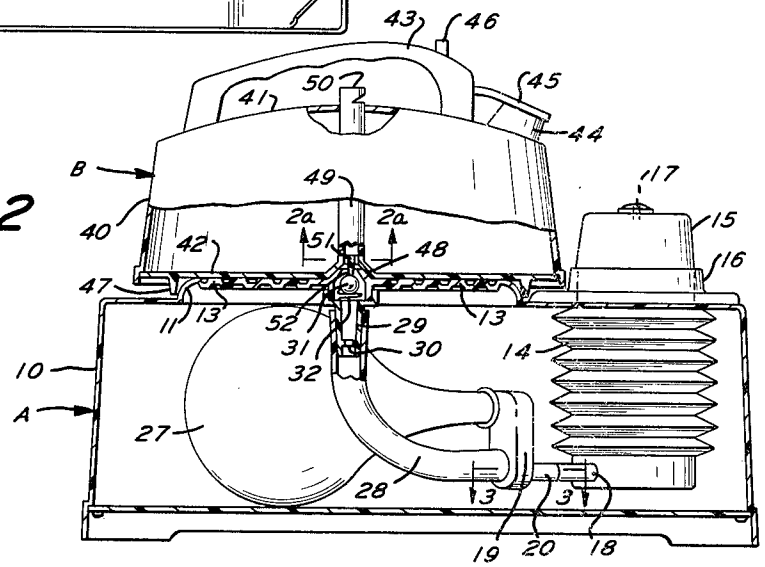


FIG. 2



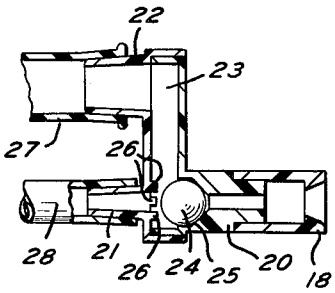


FIG. 4



FIG. 2a

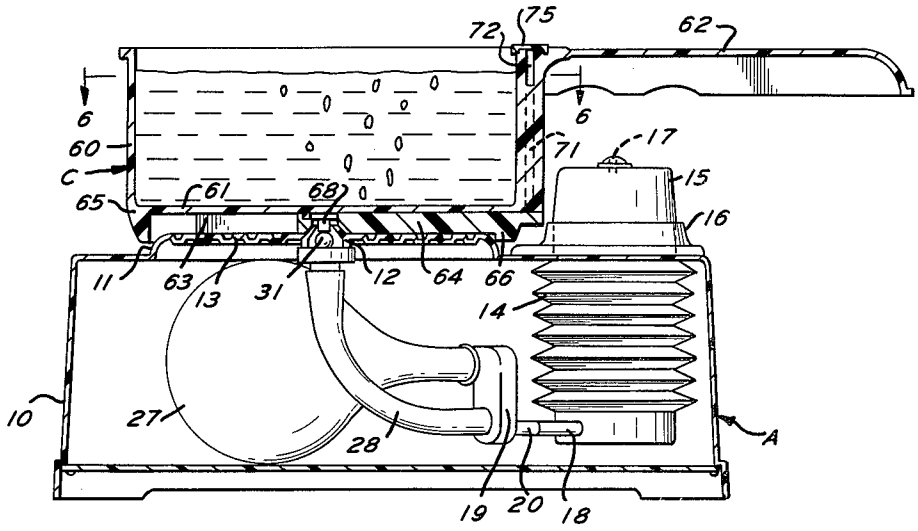
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FIG.5



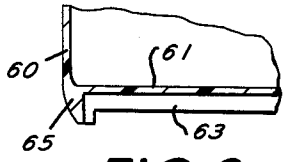


FIG.8

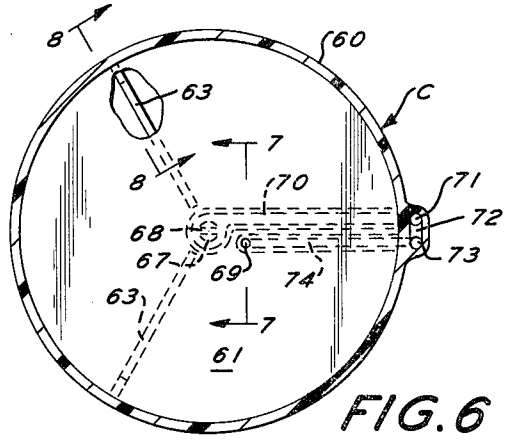


FIG.6

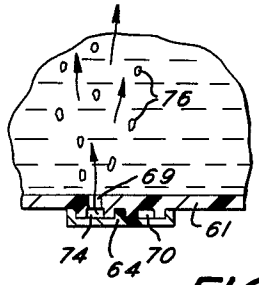


FIG.7

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PNEUMATIC TOY STOVE AND ACCESSORIES

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11 Claims. (Cl. 46—14)

This invention relates to a toy stove and to accessories which cooperate therewith to give effects reminiscent of boiling. More particularly, it pertains to a toy pneumatic reservoir, which resembles a stove, and to accessories cooperative therewith to simulate boiling. These accessories, most conveniently, are fabricated to resemble kettles, pots, pans and the like.

It has long been recognized in the toy industry that toys having the greatest play value are those which allow the child to emulate actions or activities of the parent. Yet problems are posed when the toy maker seeks to imitate a device which involves simulation of an inherently dangerous instrumentality such as, for example, heat, fire or boiling water. It is a challenge to give effects which are realistic but which, in the toy, involve no such dangerous instrumentalities. Such toys can, consequently, be used by children without adult supervision or concern.

Accordingly, it is an object of the invention to provide toys which utilize compressed air as a means for simulating boiling and the noises associated with boiling.

It is a further object of the invention to provide a pneumatic reservoir, and associated means for inflating said reservoir, in a form resembling a stove or hot plate.

It is also an object of the invention to provide a housing containing a pneumatic reservoir, means for inflating the reservoir and check valve means for preventing the escape of air from the reservoir except when accessory devices are mounted in association therewith.

An additional object of the invention is to provide accessories resembling kettles, pans and the like which contain means for tapping the pneumatic reservoir portion of a stove-like base.

Another object of the invention is to provide a toy, of the character described, which has long-lasting play value, is simple in operation, has no potential for harming the user, is economical to produce, highly efficient in operation and rugged in construction.

These and other objects of the invention will be apparent to those skilled in the art from the disclosure in the following specification, appended claims and drawings, wherein like reference numerals designate like parts, and wherein:

FIGURE 1 represents a top plan view, partially cut away, of a stove base embodying the invention.

FIGURE 2 represents a section taken through line 2—2 of FIGURE 1 modified by the inclusion of a partially cut away perspective of an accessory mounted thereon, in this case a toy tea kettle.

FIGURE 2*a* represents a section taken along line 2*a*—2*a* of FIGURE 2.

FIGURE 3 represents a section taken along line 3—3 of FIGURE 2.

FIGURE 4 represents a section taken along line 4—4 of FIGURE 3.

FIGURE 5 represents a sectional view of another embodiment of the invention showing a stove base with an accessory, in this instance a saucepan full of "boiling" water, mounted thereon.

FIGURE 6 represents a section taken through line 6—6 of FIGURE 5.

FIGURE 7 represents a fragmentary section taken along line 7—7 of FIGURE 6.

FIGURE 8 represents a fragmentary section taken along line 8—8 of FIGURE 6.

Referring now to the drawings, it will be observed that the invention comprises a housing A which may best resemble a hot plate or stove and upon which may be alternatively mounted a variety of accessories such as, for example, a whistling tea kettle B or a boiling saucepan C.

I. *Stove construction and operation*

Stove A comprises a generally rectangular housing **10** including one or more raised burner-simulating portions **11** each of which is concentric about a protruding generally frusto-conical valve housing **12**. As best seen in FIGURES 2 and 5, burner portion **11** may also be provided with a series of concentric ridges **13** which simulate the appearance of the coils of an electric burner element.

A bellows pump **14**, reciprocated by means of an integral plunger **15**, is mounted within the housing and held in place by an annular retainer **16**, within which plunger **15** is free to reciprocate. Air for the bellows enters through an orifice **17**.

Attached to the bottom of the bellows pump **14**, as by an adapter **18**, is a hollow manifold, generally **19** which includes a cored inlet leg **20**, a cored discharge leg **21** and a cored reservoir leg **22**. Manifold **19** further includes an enlarged chamber **23** within which is positioned a ball **24** in general aligned registration with opposed inlet leg **20** and discharge leg **21**. A seat **25** for ball **24** is provided within chamber **23**, proximate the inlet leg **20**. Associated with discharge leg **21** are a plurality of ball stopping pins **26**. As shown in FIGURES 3 and 4, ball **24** is resting on seat **25**. However, the ball can also rest in contact with pins **26** thus enabling communication between chamber **23** and inlet leg **20**.

Attached to reservoir leg **22**, as by mounting thereupon, is a pneumatic reservoir which may conveniently take the form of a bladder or balloon **27**.

Attached to the discharge leg **21** is a length of flexible hose **28** which connects to an adapter **29**, which mounts on valve housing **12** and forms part thereof. Adapter **29** has a cored interior and is provided with a restrictive orifice **30**.

A ball **31** is confined within housing **12** and is urged, by a spring **32**, into resilient air-sealing juxtaposition with the apical terminus of housing **12**.

Operation of the stove portion is as follows. In the position of the bellows pump **14** shown in FIGURE 1, the interior of the bellows is in communication with the atmosphere via orifice **17**. The orifice is covered, as with a thumb or finger, and plunger **15** depressed. Air, compressed within the bellows, enters inlet **20** and forces ball **24** off seat **25** so that it enters chamber **23**. This air is unable to leave through hose **28**, because ball **31** prevents flow of air out of housing **12**. Consequently, it must enter and inflate bladder **27**. When plunger **15** is released, the super-atmospheric pressure on the reservoir side of manifold **19** forces ball **24** back into contact with seat **25**. In this connection, the function of pins **26** becomes apparent. Were they not present, the ball **24** would seal discharge leg **21** as long as pressure in the manifold chamber was above that in the hose **28**. But, by spacing the ball with pins **26** to prevent sealing of outlet **21**, equal pressure is maintained in tube **28** and chamber **23** so that the pressure differential, when the plunger is released, always causes seating of ball **24** on seat **25**. Obviously, orifice **17** is only one way in which air for compression can be supplied and the use of a check inlet valve or flapper on the bellows, while more expensive, would be equally suitable.

After bladder **27** is fully inflated, a reservoir of compressed air exists which can be used for creating the effects first mentioned. Discharge of the air can be achieved only through mechanical depression or unseat-

ing of ball **31** and this is an important part of the action of the accessories which will now be discussed.

II. *Whistling tea kettle*

One air-utilizing accessory suitable for use with stove A is the whistling tea kettle B, shown in FIGURE 2. This tea kettle includes a housing having sides **40**, a top **41** and a bottom **42**. The kettle is provided with a handle **43**, a spout **44** and a hinged spout cap **45** which is conveniently opened and closed with cap operator **46**. All of these features simulate the appearance and function of full size tea kettles commonly available. The construction is water tight throughout so that the kettle holds water. It may be filled and emptied through spout **44**.

Bottom **42** is provided with a dependent circular lip **47**, the diameter of which complements the diameter of burner portion **11**. As shown, the lip **47** retains the kettle on the burner **11** against transverse misalignment. Additional alignment is provided by frusto-conical bottom portion **48** which complements valve housing **12** and fits over it when kettle B is mounted on stove A. An internal tube **49** is mounted on the apical section of bottom portion **48** and rises vertically, along the axis of the kettle, terminating after it passes through top **41** in a whistle **50**. At the mouth or inlet of tube **49** is provided a bar **51** which terminates in a dependent ball depresser portion **52**, as particularly shown in FIGURE 2*a*.

Operation is relatively straightforward. A child fills the kettle with water and places it upon stove A, the bladder **27** of which has previously been inflated. Lip **47** aids in seating bottom **42** over burner portion **11** so that housing **12** enters bottom portion **48**. When this occurs, depresser **52** penetrates housing **12** to depress ball **31** and permit air to flow out of bladder **27**, through manifold **19** and tube **28**. The rate of air flow from tube **28** is limited by orifice **30**. The air enters the interior of portion **48**, passes around bar **51**, and rises through tube **49**. As the air leaves through whistle **50** it produces the noise characteristic of whistling tea kettles. The bladder **27** may be reinflated, even during this operation, since the resistance to air flow offered by orifice **30** can, if desired, be made greater than the resistance to inflation offered by the bladder. Because of this, operation of pump **14** will cause more air to flow into the bladder than through hose **28**.

III. *Boiling saucepan*

Other accessories such as, for instance, saucepan C can be provided for simulating the boiling of water by sparging air into a body of water. Pan C includes sides **69**, a bottom **61** and a handle **62**. The underside of bottom **61** is provided with two radially extending legs **63** and an air channel cover **64** which together provide tripod support for the pan on burner portion **11**. A lip **65**, in the vicinity of legs **63**, and a shoulder **66**, in channel **64**, keep the pan transversely aligned on portion **11**. The junction of legs **63** and air channel **64** is shaped to form an opening **67** having a circular cross section and contoured to snugly receive valve housing **12**. A tongue **68** is mounted within opening **67** and depresses ball **31** when pan C is in the position shown in FIGURE 5. A series of air channels are provided which connect opening **67** with an air sparger such as orifice **69** in bottom **61**. These channels include a radial feed channel **70**, a vertical riser **71**, a cross channel **72**, an anti-siphon channel **73**, and a transverse delivery channel **74**. A removable cover **75** is provided to give access to channels **71**, **72** and **73** for cleaning. The reason for use of channels **71** and **73** as well as for the relatively high location of cross channel **72** is to prevent water from flowing out of the pan through orifice **69** and finding its way out through opening **67**.

In operation, the pan is filled with water, as indicated in FIGURE 5. The level will always tend to be below the level of cross channel **72** and consequently no water will leave through orifice **69**, except that necessary to fill anti-siphon channel **73** to the level which obtains in the pan. The pan is then placed on stove portion **11**, with lip **65** and shoulder **66** aiding in alignment, so that housing **12** nests in opening **67** and tongue **68** depresses ball **31**. Air then leaves bladder **27** and travels through air channels **70**, **71**, **72**, **73** and **74** seriatim to be sparged, through restrictive orifice **69**, into the body of the liquid. The air creates a series of bubbles **76** and also makes the surface of the water turbulent, effects both reminiscent of boiling.

Although the invention has been described in considerable detail, such description is intended to be illustrative rather than limiting, since the invention may be variously embodied and its extent, consequently, is to be determined by the appended claims.

Having described our invention, we claim:

1. A pneumatic toy comprising (a) a housing having the configuration of a stove; a pneumatic reservoir within said housing; means for inflating said reservoir and means for preventing the escape of air from said reservoir and (b) an accessory removably mounted on said housing including means for tapping said reservoir, operative only so long as said accessory is mounted on said housing; and means for utilizing compressed air from said reservoir to produce effects reminiscent of boiling.

2. The toy of claim **1** wherein said means for utilizing compressed air from said reservoir includes a whistle.

3. The toy of claim **1** wherein said means for utilizing compressed air from said reservoir comprises a vessel for holding a body of water so that its surface is visible, said vessel further including a sparger for introducing compressed air from said pneumatic reservoir into the body of water in a manner to produce hydraulic turbulence reminiscent of boiling.

4. A pneumatic toy comprising a housing having the configuration of a stove; a bladder within said housing; a pump for inflating said bladder, mounted on said housing; a pneumatic manifold within said housing including a body portion provided with (a) an inlet leg, (b) a discharge leg, (c) a bladder leg, on which said bladder is mounted, and a first check valve adapted to seat, alternatively, so as to block said inlet leg (a) and said discharge leg (b)—in the first of said alternative positions preventing flow of air into said pump and, in the second of said alternative positions, restricting flow of air into said discharge leg; a first conduit connecting the discharge of said pump and said inlet leg; a second conduit connecting said discharge leg and the exterior of said housing and a second, normally-closed check valve at the outlet of said second conduit, mounted on said housing; operation of said pump inflating said bladder via said manifold and opening of said second check valve from the exterior of said housing causing air to be discharged from said bladder via said manifold and said second conduit.

5. A pneumatic toy comprising, in combination, a stove portion and an accessory removably mountable thereon and supportable thereby, said stove portion including a housing; a pneumatic reservoir within said housing; a pump for inflating said reservoir mounted on said housing; first conduit means connecting the discharge side of said pump with said reservoir; first check valve means between said pump and said first conduit means permitting compressed air to flow only from said pump into said first conduit; a second normally-closed check valve mounted in said housing and operable from the exterior thereof; and second conduit means connecting said first conduit means and said second check valve; operation of said pump inflating said reservoir and discharge of air from said reservoir being effected only by the opening of said second check valve which occurs when said accessory is mounted on said stove portion; said accessory including a portion which contacts and holds open said second normally-closed check valve; said accessory further including conduit means for receiving the stream of compressed air discharged from the pneumatic reservoir of said stove portion via said second check

valve; and said accessory also including means for utilizing said stream of compressed air for producing an effect reminiscent of boiling.

6. The toy of claim 5 wherein said air utilization means includes a whistle.

7. The toy of claim 5 wherein said air utilization means comprises means for retaining a body of water so that its surface is visible; a sparger for introducing compressed air into the body of water; conduit means for directing air coming from said pneumatic reservoir to said sparger, and anti-siphon means for preventing water from leaving the accessory through said sparger.

8. An accessory for use in connection with a toy stove containing a pneumatic reservoir sealed by a normally-closed check valve, said accessory comprising a casing; means dependent from said casing adapted to contact said check valve and hold it open; conduit means for receiving a stream of compressed air coming out through said check valve; means for retaining a body of water so that its surface is visible; a sparger connected to said conduit means for introducing compressed air into the body of water to produce an effect reminiscent to boiling; and anti-siphon means for preventing water from flowing out of said accessory through said conduit means.

9. An accessory for use in connection with a toy stove, the top of which has a valve housing, within which housing is a check valve through which compressed air may be discharged, said accessory comprising a casing contoured to rest upon and be supported by the top of said stove; a conical opening in the bottom of said casing adapted to sealingly receive the valve housing; a tongue

coaxially mounted within said conical opening and providing an annular air passageway between it and the walls of said opening, said tongue penetrating said valve housing and opening said check valve when said valve housing is within said conical opening; a conduit for receiving the stream of compressed air coming out through said check valve; and means associated with said conduit for utilizing the stream of compressed air to produce an effect reminiscent of boiling.

10. The accessory of claim 9 wherein said air utilization means includes a whistle connected to said conduit.

11. The accessory of claim 9 wherein said air utilization means includes means for retaining a body of water so that its surface is visible; a sparger connected to said conduit for introducing compressed air into the body of water; and anti-siphon means for preventing water from flowing out said accessory to said conduit.

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RICHARD C. PINKHAM, *Primary Examiner.*