# United States Patent [19]

**Bauerlein et al.**

[11] **3,750,908**

[45] **Aug. 7, 1973**


[54] **CONCENTRATE DISPENSER WITH SUPPLY CONTAINER REMOVABLE FROM PERISTALTIC PUMP**


[75] Inventors: **Carl C. Bauerlein; Linda M. Wertz; Kenneth L. Acuff,** all of Clearwater, Fla.

[73] Assignee: **Lykes Pasco Packing Co., Dispenser Manufacturing Div.,** Clearwater, Fla.



[22] Filed: **Oct. 2, 1970**

[21] Appl. No.: **77,431**

[52] **U.S. Cl.** ..... **222/80,** 222/129.2, 222/214, 222/325, 417/476

[51] **Int. Cl.** ..... **F04f 3/00**

[58] **Field of Search** ..... 222/80, 82, 129.2, 222/132, 325, 372, 382, 569, 214; 417/474, 475, 476, 477



[56] **References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 3,323,681 | 6/1967 | Di Vette et al. | 417/476 X |
| 3,531,021 | 9/1970 | Bassett | 222/214 X |
| 3,396,669 | 8/1968 | Everett | 417/476 |
| 1,874,667 | 8/1932 | Wada | 417/477 X |
| 2,766,610 | 10/1956 | Bauerlein | 222/129.2 |
| 3,438,548 | 4/1969 | Ceyba | 222/80 |
| 2,662,666 | 12/1953 | Lampert | 222/214 X |
| 3,263,876 | 8/1966 | Perfetto | 222/569 |
| 3,232,496 | 2/1966 | Rockwell, Jr. et al. | 417/476 X |
| 2,015,123 | 9/1935 | Pennel | 417/477 X |
| 3,227,091 | 1/1966 | Isreeli et al. | 417/477 X |



*Primary Examiner*—Robert B. Reeves
*Assistant Examiner*—David A. Scherbel
*Attorney*—Stefan M. Stein



[57] **ABSTRACT**

A dispenser designed to mix a relatively viscous concentrate contained in a disposable container removably mounted therein with a diluent and then dispense the resultant diluted mixture. A peristaltic type pump is used on a flexible conduit which is removably connected between the disposable container and a mixing nozzle assembly. The mixing nozzle assembly includes a valve arrangement for controlled mixing of the diluent with the concentrate in proper porportions immediately prior to exiting from the dispenser.


**8 Claims, 18 Drawing Figures**

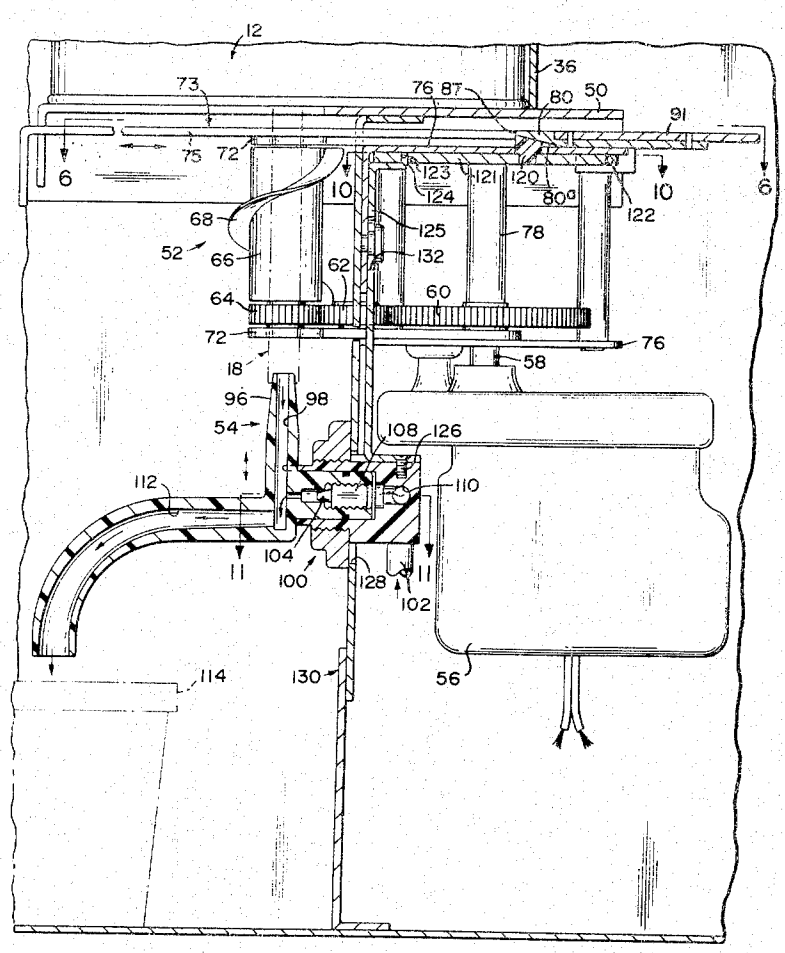


FIG. 1

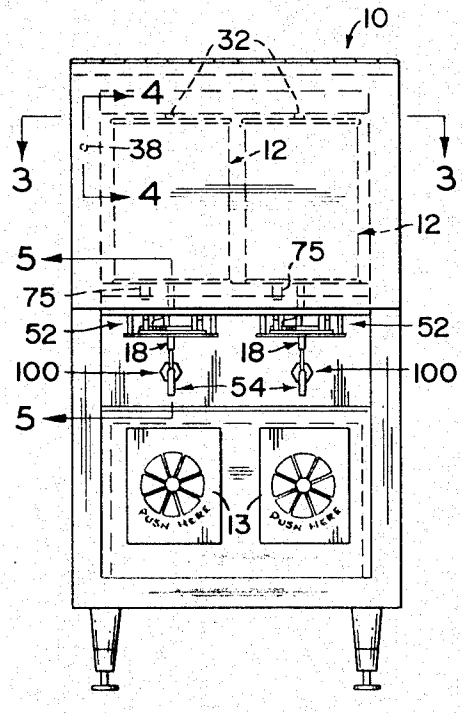
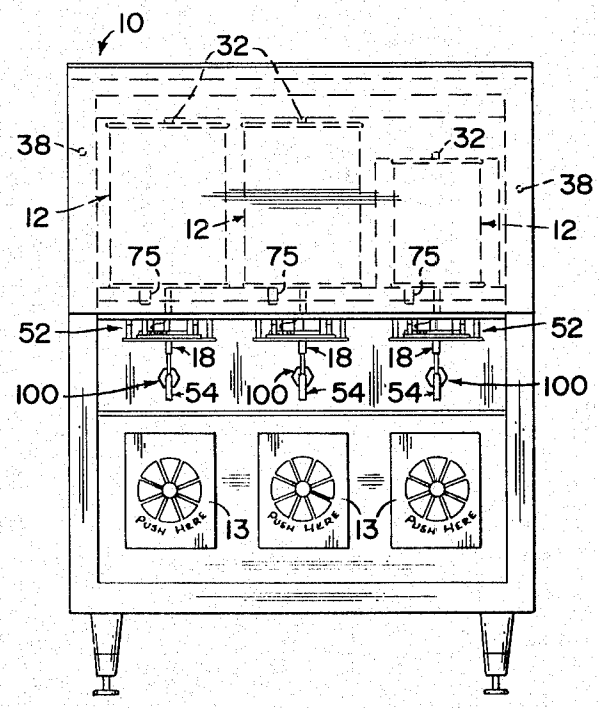



FIG. 1A



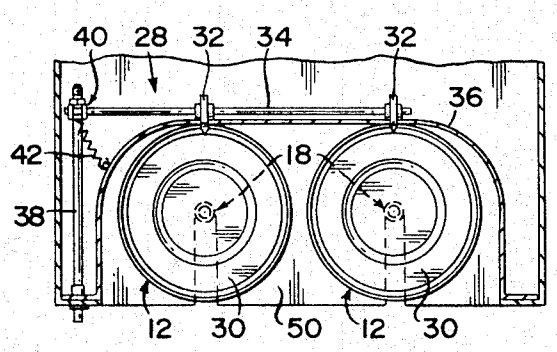




FIG. 3

FIG. 4

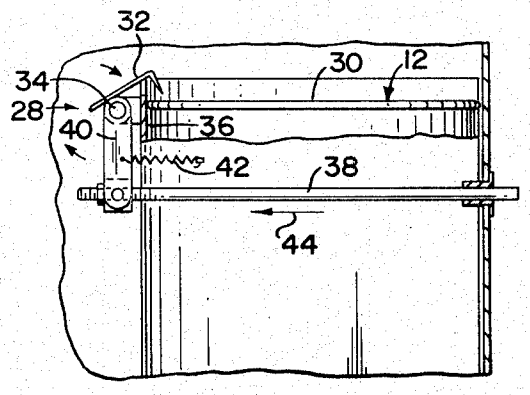



FIG. 2

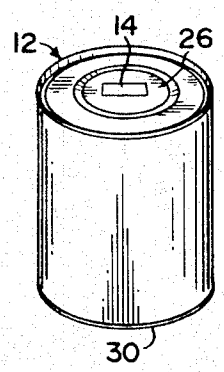
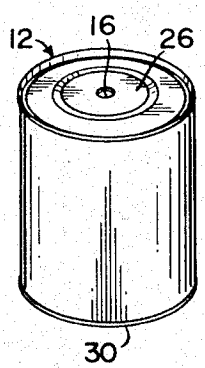



FIG. 2A



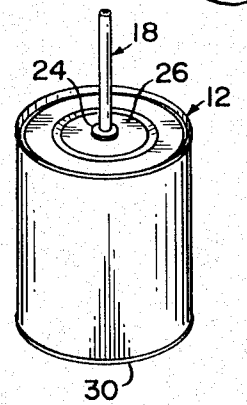




FIG. 2B

INVENTORS
CARL C. BAUERLEIN
LINDA M. WERTZ
BY KENNETH L. ACUFF
Stefan M. Stein
ATTORNEY.

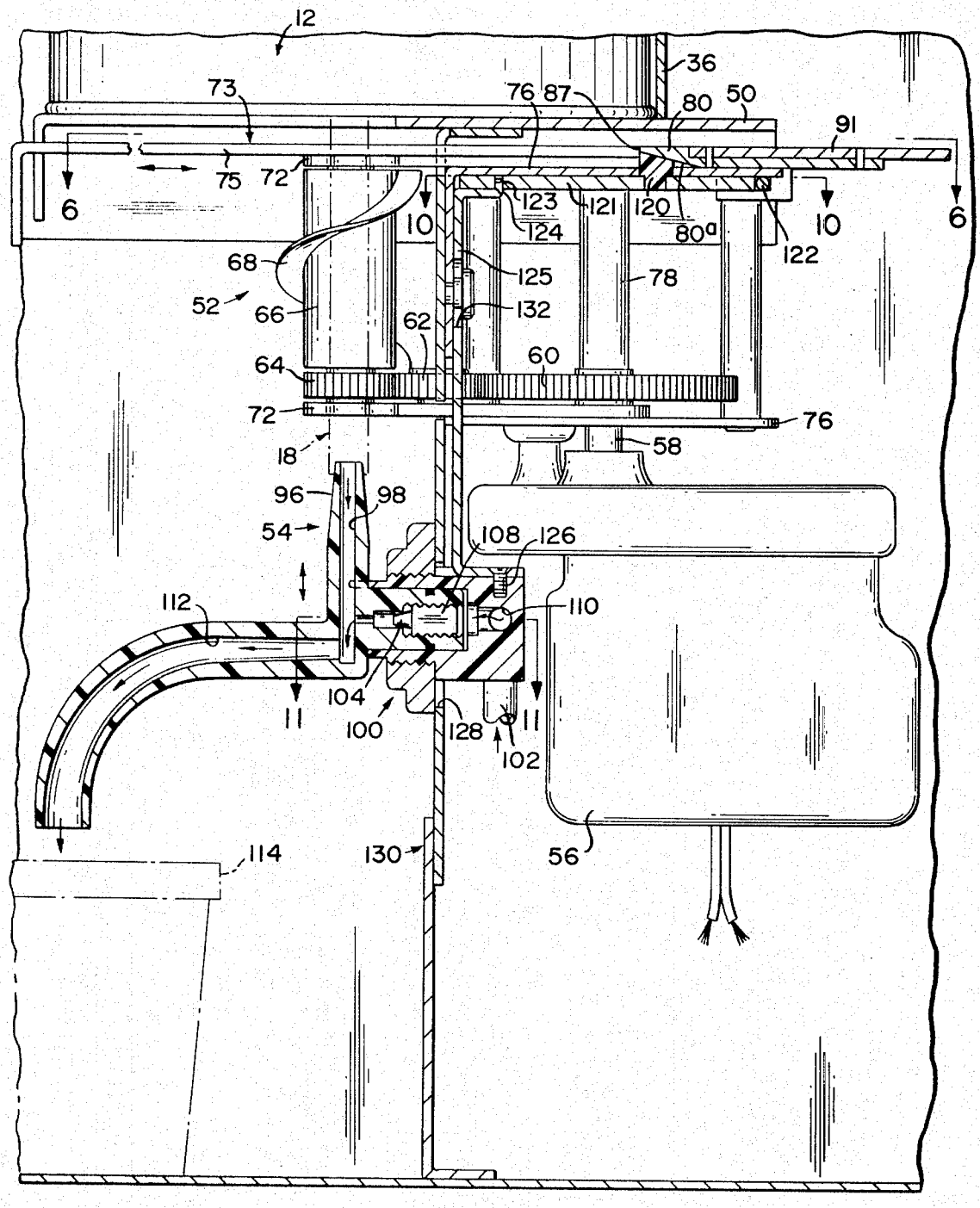



FIG. 5

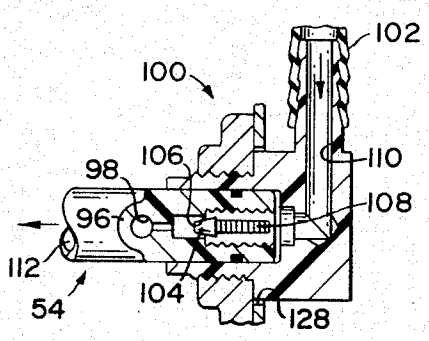



FIG. 11

INVENTORS
CARL C. BAUERLEIN
LINDA M. WERTZ
BY KENNETH L. ACUFF
Stefan M. Stein
ATTORNEY.

FIG. 6A

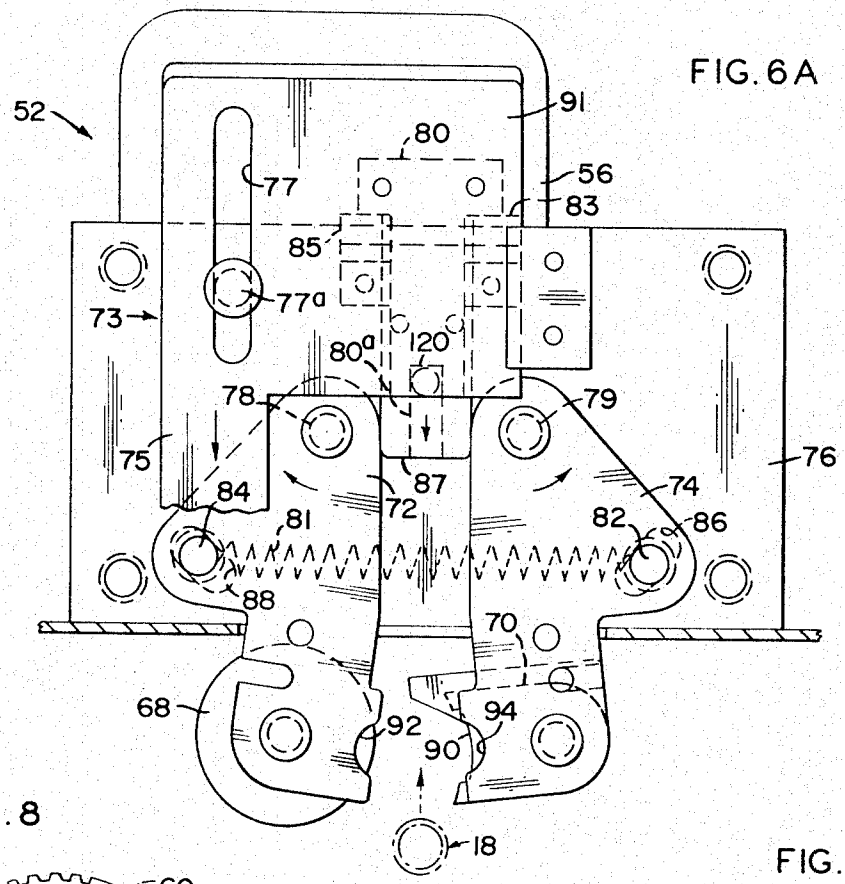



FIG. 8

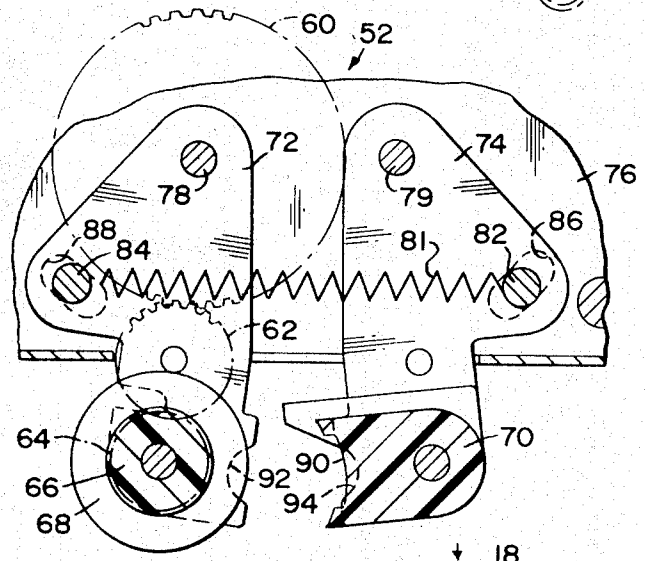
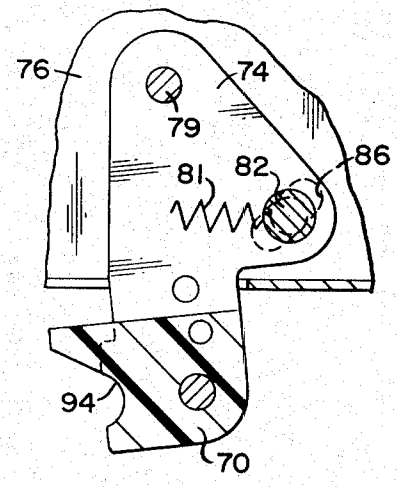



FIG. 9



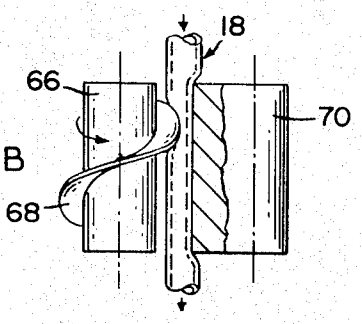




FIG. 6B

INVENTORS
CARL C. BAUERLEIN
LINDA M. WERTZ
BY KENNETH L. ACUFF
Stefan M. Stein
ATTORNEY.

FIG. 6

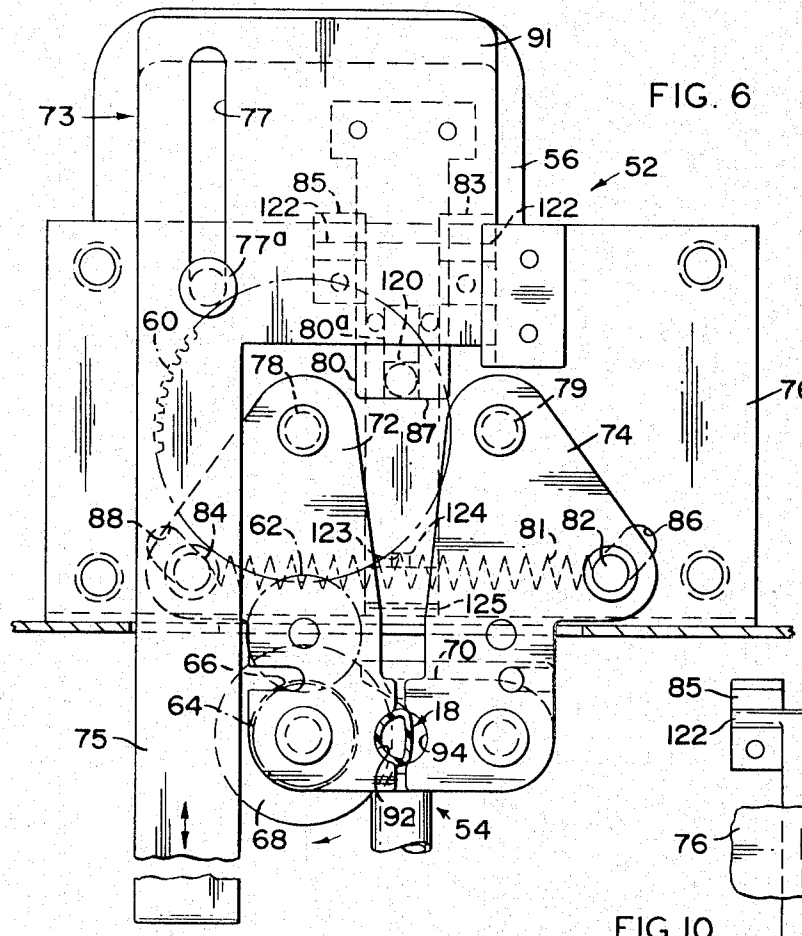
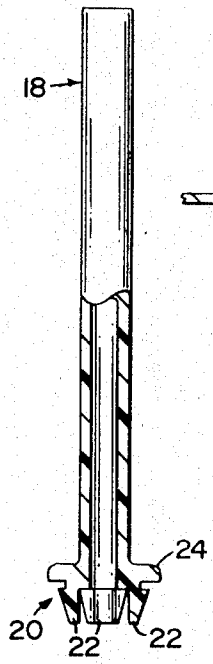



FIG. 12



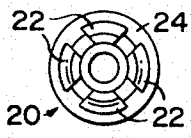




FIG. 13

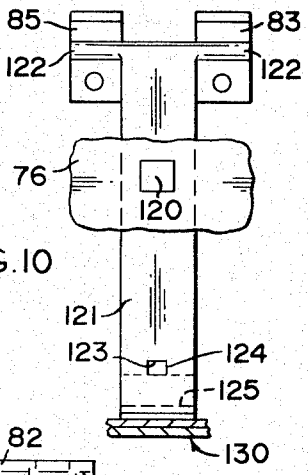



FIG. 10

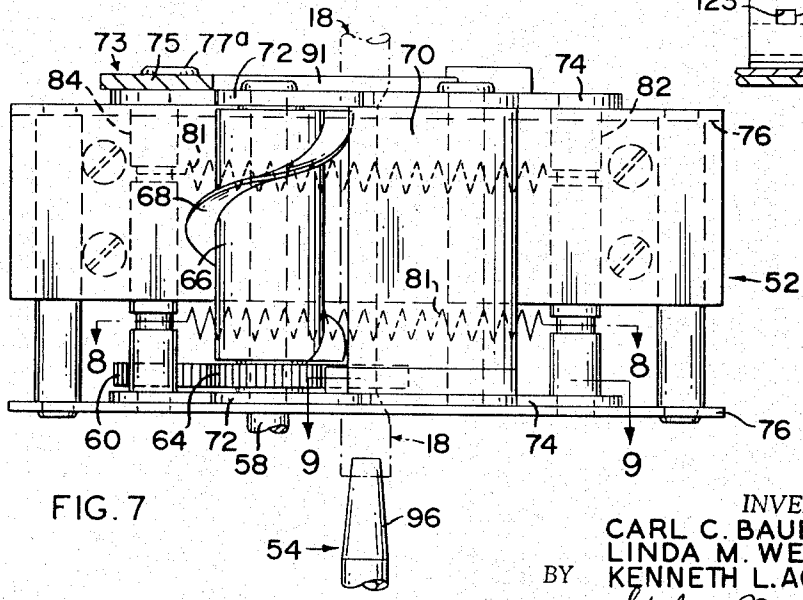



FIG. 7

INVENTORS
CARL C. BAUERLEIN
LINDA M. WERTZ
BY KENNETH L. ACUFF
Stefan M. Stein
ATTORNEY.

# CONCENTRATE DISPENSER WITH SUPPLY CONTAINER REMOVABLE FROM PERISTALTIC PUMP

The present invention involves a post-mix dispenser capable of handling relatively high density of viscous concentrates directly from a disposable container. The concentrate is delivered, in regulated flow to a mixing nozzle where it is mixed with the proper amount of diluent prior to being dispensed.

There are large numbers of dispensers presently on the market designed to dispense liquid foods such as orange juice, tomato juice, grape juice etc. Originally, the majority of them were of the pre-mix type wherein the liquid concentrate was placed in a large container or bowl into which was also added the proper amount of diluent. The diluent was manually pre-mixed with the concentrate prior to dispensing of the liquid food. Circulating means of some sort was usually required in order to keep the mixture uniform thereafter.

Presently, the use of post-mix dispensers have become popular because they have been found to be much more economical and efficient. In addition, they dispense a product vastly superior in flavor. The taste almost perfectly duplicates fresh fruit juice. The separate storing of the concentrate and the diluent also provides increased stability and a longer overall shelf life. It is also easier to properly mix, in the correct ratio, the concentrate and the diluent prior to being dispensed. Such eliminates the need for circulating means previously required. Circulating means besides being costly, furthermore do not insure a properly mixed product being delivered from the dispenser.

While it is well recognized that post-mix dispensers are preferable to the pre-mix type dispenser, as pointed out above, various disadvantages and inherent problems have been discovered with currently available post-mix type dispensers. The vast majority of them are designed to dispense concentrate only in the range of 42–51° Brix. It is well known that the higher the Brix, the longer the storage life of the concentrate. For example, the storage life of 65° Brix concentrate is approximately three months whereas concentrate of 42–51° Brix has only a limited storage life of two to three weeks. Unfortunately, however, 65° Brix concentrate is much more viscous. This creates a problem of waste when trying to transfer such high density concentrate from one container to another.

To date, all post-mix dispensers have been designed with permanently installed concentrate storage containers which are loaded by dumping from conventional cans. It should readily be apparent, that when dealing with a high density concentrate in the range of 65° Brix, a considerable amount of concentrate is left in the conventional can.

Permanently installed concentrate storage containers also suffer the disadvantage of being difficult to clean and to meet sanitation requirements called for by the Food and Drug Administration or local health authorities. Cleaning difficulties are also one of the major reasons causing clogging of the machine and accounts for the majority of expensive and troublesome service calls experienced by distributors.

All of these problems present in prior art devices are solved in this invention which is directed to a post-mix type dispenser designed to have removably mounted therein a disposable and combined shipping and dispensing container. The problem of sanitation is further reduced by having various other structural elements coming in contact with the concentrate being designed to be disposable and removably mounted within the dispenser so as to avoid cleaning of these parts when a new supply of concentrate is added.



Accordingly, it is an object of this invention to provide a post-mix type dispenser which includes a disposable dispensing container removably mounted within the dispenser so as to allow efficient installation and removal of the container.

Another object is to provide a post-mix dispenser including a combined disposable dispensing and shipping container which accomplishes the efficient dispensing of high Brix concentrate directly from the shipping container thereby eliminating waste.

Another object is to provide a post-mix type dispenser including a disposable dispensing container wherein the dispensing container is suitable for storage and shipping of a high Brix concentrate prior to use in the dispenser, thereby eliminating cleaning and sanitation problems associated with the container.

Another object is to provide a post-mix dispenser including a disposable dispensing container suitable for shipping and storage of a high Brix concentrate wherein the concentrate can be stored in the dispenser for relatively long periods.

Still another object is to provide a post-mix type dispenser wherein a plurality of variable size disposal dispensing containers may be removably mounted within the dispenser so as to provide for the dispensing of a plurality of different post-mix products.

A further object is to provide a post-mix type dispenser which includes disposable means for conveying the contents of the dispensing container to the mixing area of the dispenser.

More specifically, it is an object to provide a post-mix type dispenser which includes a disposable conduit means removably attached to the disposable dispensing container serving to channel the contents of the dispensing container to the mixing area of the dispenser in such a manner as to eliminate sanitation problems associated with the dispenser.

A still further object of the present invention is to provide a post-mix type dispenser which includes a pump assembly for delivering the contents of the disposable dispensing container in a regulated fashion to the mixing area of the dispenser.

Another object is to provide a post-mix type dispenser which includes a pump assembly movably mounted so as to move into and out of operative locking engagement with the flexible conduit means serving to channel the contents of the disposable dispensing container to the mixing area of the dispenser.

Another object is to provide a post-mix type dispenser which includes a mixing nozzle assembly for receiving a predetermined amount of concentrate and diluent material.

Another object is to provide a post-mix type dispenser which includes a mixing nozzle assembly comprising an adjustable valve for regulating the flow of diluent to the mixing area of the dispenser.

Another object is to provide a post-mix type dispenser which includes a flexible conduit means removably connected to each of the disposable dispensing container, pump assembly and mixing nozzle assembly such that the contents of the disposable dispensing con-

tainer is channeled from the container to the mixing area of the dispenser in a regulated fashion.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

In accordance with the above cited objects, the present invention comprises a dispensing device primarily designed to dispense liquid foods such as juices or the like wherein the dispensed liquid is formed from mixing a relatively high density liquid concentrate with a diluent immediately prior to dispensing of the liquid from the device. More specifically a portable, disposable or "throw-away" type container is removably mounted within the dispenser and serves to store the liquid concentrate. In the preferred embodiment of this invention the container in which the concentrate is shipped is designed to serve as the disposable dispensing container. Accordingly, the shipping container of a concentrate so used must be adapted to allow for the attachment of a conduit means designed to direct the flow of a concentrate to the mixing area of the dispenser as will be explained in greater detail later. The dispenser itself is designed to have the dispensing container removably mounted therein such that a flexible conduit means is removably attached thereto and positioned in cooperating relation with a peristaltic type pump.

The peristaltic pump is part of the pump assembly which further comprises a rotatable shaft having a substantially helically mounted flange formed along the outer periphery of the shaft. The pump assembly further comprises a backup plate which may be positioned in cooperating relation with the rotating shaft. More specifically, both the rotating shaft and the backup plate are pivotally mounted so as to move into intimate operative engagement with the flexible conduit means extending from the disposable container. When in operative position the backup plate engages the flexible conduit in a supporting relation while the helical flange engages and accordingly deforms or depresses the flexible conduit means in a continuous descending fashion. This action of both the support plate and the helical flange serves to force the concentrate through the flexible conduit in a peristaltic fashion wherein the concentrate is delivered to a mixing nozzle assembly.

The flexible conduit is also removably attached to the mixing nozzle which is positioned to receive the regulated flow of concentrate. The mixing nozzle assembly includes an adjustable valve member which serves to regulate the desired amount of flow of diluent into a mixing area of the nozzle for proper mixture with the simultaneously admitted concentrate.

Accordingly, immediately prior to dispensing, the concentrate is mixed with the diluent in proper proportions to provide a desired taste, consistency and density of the product to be dispensed.

Upon emptying of the concentrate from the disposable container, means are provided to "unclamp" the pump assembly from the flexible conduit means. More specifically, the rotatable shaft and supporting backup plate are moved in a pivotal fashion away from one another by means of a reciprocally mounted plate which acts as a wedge-like member to disengage both the rotatable shaft and the backup plate from operative engagement with the flexible conduit means. After unclamping of the pump assembly the entire disposable dispensing container is removed along with the attached flexible conduit which also may be readily detached from the mixing nozzle assembly. A fresh supply of concentrate may be readily inserted in the dispenser merely by attaching a new flexible conduit to the container inverting the container, attaching the flexible conduit to the mixing nozzle assembly and re-engaging the pump assembly in operative engagement with the conduit as described above.

The present invention further includes piercing means which may be pivotally or movably mounted, by means of a spring biased lever, to puncture the bottom side of the installed disposable dispensing container after is has been inverted and mounted within the dispenser. This, of course, is necessary to allow proper flow of the concentrate out of the container and through the flexible conduit means.

Another embodiment of the present invention is directed to a dispenser wherein a plurality of different sized dispensing containers may all be simultaneously mounted in removable fashion within the dispenser.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the constructions hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

FIGS. **1** and **1A** are plan front views of the exteriors of different embodiments of the present invention.

FIGS. **2**, **2A** and **2B** are perspective views of a disposable dispensing container and an attached conduit means.

FIG. **3** is a top cross sectional view taken along line **3—3** of FIG. **1** showing the piercing means of the present invention.

FIG. **4** is a cross sectional view taken along line **4—4** of FIG. **1** showing the piercing means of the present invention.

FIG. **5** is a cross sectional side view taken along line **5—5** of FIG. **1** showing the mixing nozzle of the present invention.

FIG. **6** is a cross sectional top view taken along line **6—6** of FIG. **5** and shows details of the pump assembly.

FIG. **6A** is a top view of the pump assembly in open unlocked position relative to the flexible conduit means.

FIG. **6B** is a front view of the pump assembly of the present invention in operative engagement with the flexible conduit means.

FIG. **7** is a front cross sectional view of the pump assembly.

FIG. **8** is a top cross sectional view taken along line **8—8** of FIG. **7.**

FIG. **9** is a top cross sectional view taken along line **9—9** of FIG. **7.**

FIG. **10** is a top cross sectional view taken along line **10—10** of FIG. **5** showing the slide plate of the present invention.

FIG. **11** is a top cross sectional view taken along line **11—11** of FIG. **5** showing the adjustable valve interior.

FIG. **12** is a side view, partially in section, of the flexible conduit means.

FIG. **13** is a bottom view of the flexible conduit means.

Similar reference characters refer to similar parts throughout the several views of the drawings.

In that the structural elements associated with each of the individual containers are essentially the same, specific reference will not be made to each of the structural elements associated with each of the separate containers and it is herein intended that a discussion of one cooperative set of elements will be representative of all.

The dispenser of the present invention is shown in FIGS. 1 and 1A as including an outer casing generally indicated as **10.** As shown, the dispenser may be adapted to hold a plurality of different sized containers **12** which are removably mounted in an inverted fashion.

More specifically and with reference to FIGS. **2,** 2A and 2B, the containers **12** are designed to hold the liquid concentrate. Accordingly, an important feature of the present dispenser is the capability of utilizing a disposable type container as shown in FIGS. **1** and 1A. It is intended that the liquid concentrate may be shipped or stored in container **12** and that provision be made in its structural design to allow it to act as a dispensing container. Therefore, a sealing means **14** which may be a pressure sensitive or tear away tape is provided to cover centrally located aperture **16** to prevent leakage of the concentrate from container **12** during shipping or storage. Before placing the disposable dispensing container **12** in the dispenser, the sealing means **14** is removed and a flexible conduit means **18** is inserted in aperture **16** as shown. With specific reference to FIG. **12** the flexible conduit means **18** is shown as having a connection generally indicated as **20** integrally formed at one extremity of the conduit means **18.** The connection **20** includes a plurality of prongs **22** designed to be inserted into the container **12,** such that an outwardly extending annular flange **24** remains on the exterior surface **26** of container **12** and serves as a sealing means when the container is removably mounted in the dispenser in an inverted fashion as shown in FIGS. **1** and 1A.

With further reference to FIGS. **1** and 1A, control buttons **13** are provided on the exterior of casing **10** and serve to activate the dispensing cycle when depressed by a user of the dispenser.

With specific reference to FIGS. **3** and **4** the present dispenser further includes a piercing means generally indicated as **28** and designed to pierce or puncture end surface **30** of dispensing container **12** once it is inserted in the dispenser.

Puncturing the dispensing container **12** in this or like fashion is necessary to relieve any negative pressure within the container which would of course impede the flow of the contents of dispensing container **12** through flexible conduit **18.** The piercing means include at least one piercing member **32** pivotally mounted on shaft **34** which in turn is attached to mounting plate **36.** Shaft **34** is connected to reciprocating shaft **38** by means of linkage **40** which is biased in the position shown in FIG. **4** by means of spring **42.** Accordingly, as shaft **38** moves in the direction of arrow **44** (FIG. **4**) link member **40,** shaft **34** and piercing member **32** are all forced to rotate in a clockwise direction against the force of spring **42** thereby causing the piercing member **32** to pierce the end surface **30** of dispenser container **12** so as to provide the proper vent aperture.

Turning now to FIG. **5,** the disposable dispensing container **12** is shown mounted in an inverted operative position on support plate **50.** For the purposes of clarity flexible conduit means **18** is represented in broken lines as extending from dispensing container **12,** in cooperative relation to pump assembly **52** and removably connected to mixing nozzle assembly generally indicated as **54.**

Electric motor **56** is provided to operate pump assembly **52** by means of rotating drive shaft **58** which, in turn, rotates drive gear **60.** Idler gear **62** is driven by gear **60** and, in turn, serves to rotate gear **64** which is attached to one extremity of rotatably mounted shaft **66.** An outwardly extending flange **68** is mounted in a helical configuration along the periphery of shaft **66** and serves to provide pumping action by operatively engaging flexible conduit **18** as will be fully explained later.

As clearly shown in FIGS. **6,** 6A, 6B, **8** and **9,** the pump assembly **52** further includes a backup or support block **70** arranged in cooperating relation with helical flange or thread **68** and shaft **66.** Both shaft **66** and backup block **70** are mounted on arm members **72** and **74** respectively wherein these arm members are pivotally mounted on support plate **76** by means of support shaft **78** and **79** respectively. Spring member **81** is connected at each extremity to connecting members **82** and **84** which themselves are arranged in elongated slots **86** and **88** formed on support plate **76.** Arm member **72** and **74** are biased to move towards each other into operative position as shown in FIG. **6.** Idler gear **62** is also mounted on arm member **72** and is movable along with arm member **72** while maintaining engagement with both drive gears **60** and shaft gear **64.**

Rotatable shaft **66** and therefore flange **68** may move into and out of operative clamping position along with backup block **70** in relation to flexible conduit means **18.** This relationship is clearly shown in FIG. **6B** wherein a longitudinal portion of flexible conduit means **18** abuts backup block **70** in supporting relation such that flange or thread **68** descends along the supported longitudinal portion of flexible conduit **18** as shaft **66** rotates. Flange **68** thereby depresses or deforms flexible conduit **18** as shaft **66** continuously rotates which in turn forces any liquid or concentrate within the flexible conduit **18** to pass therethrough is a peristaltic fashion.

As pointed out above, arm member **72** and **74** are movable into and out of what may be referred to as an operative clamping position relative to flexible conduit **18.** This movable feature of the pump assembly is an important advantage in the present invention in that it readily allows the conduit means **18** and consequently the disposable dispensing container **12** to be easily connected to and removed from the pump assembly and therefore allows efficient installation and disposal of the dispensing container **12.** This clamping and unclamping action of the pump assembly is provided by a reciprocal slide means (FIGS. **6** and 6A) which may be generally indicated as **73.** The reciprocal slide means includes an elongated push arm **75** integrally attached to the main body portion of reciprocal plate **91.** An elongated slot **77** is formed in the plate **91** and arranged to cooperate with bolt or fastening means 77a in a sliding relation. Referring specifically to FIG. **10,** a wedge member **80** is connected directly to reciprocal plate **91** by means of connecting brackets **83** and **85.** Wedge member **80** is arranged on reciprocal plate **91** such that the free extremity **87** of wedge member **80** is aligned between pivot arm **72** and **74** of the pump as-

sembly. As clearly shown in FIG. 6A, reciprocation of reciprocal plate **91** causes extremity **87** of wedge member **80** to be forced between pivot arm **72** and **74** thereby pivoting rotatable shaft **66** and backup block **70** out of operative relation and into an unclamping position relative to flexible conduit **18.** In order to facilitate the supporting and clamping of flexible conduit **18** by the backup block **70** and rotatable shaft **66,** the block **70** and arms **72** and **74** have specifically configured arcuate surfaces **90** and **92, 94** respectively, which conform to the shape of flexible conduit **18.**

Referring again to FIG. **5,** the dispenser of the subject invention includes mixing means which comprises the mixing nozzle, as **54** designed to be removably connected, by means of the nipple **96,** to one end of flexible conduit means **18.** As is apparent, the action of pump assembly **52** forces concentrate through flexible conduit **18** in peristaltic fashion wherein the concentrate is continuously directed into the mixing nozzle **54** through channel **98** defined within nipple **96.** The adjustable valve assembly **100** is threadably connected to the mixing nozzle **54** in such a manner as to direct diluent fluid from a supply (not shown) through conduit **102** and into the lower portion of channel **98** through orifice **101.** It is important that the size of orifice **101** be such as to create a high velocity jet of diluent issuing into channel **98.** This fact plus the positioning of orifice **101** so that the diluent enters channel **98** at a substantially right angle to the flow of concentrate, causes turbulence in the mixing area. Such turbulence is important in accomplishing proper mixing of diluent and concentrate. Additional turbulence and consequently more efficient mixing occurs due to another change in direction as the mixed product exits from conduit **112.** The lower portion of channel **98** comprises the mixing area of the dispenser where proportions of the diluent are mixed with the concentrate flowing from flexible conduit **18.** Additional turbulence is created by the mixed product flowing at substantially right angles into conduit **112.**

As clearly shown in FIG. **11** valve element **104** is adjustably positioned relative to valve seat **106** by means of a threaded or like connection **108** such that the flow of liquid may be regulated as it passes through conduit **102** channel **110** and about valve element **104.** Accordingly the amount of diluent entering channel **98** is regulated so as to correspond with the amount of liquid concentrate passing into channel **98** from flexible conduit **18** in order to establish the desired density and mixture of the liquid product being dispensed.

After mixture of the concentrate and diluent in the mixing area, the mixed liquid then passes through a delivery channel **112** and into the desired cup or vessel **114.**

In operation, a cup **114** or like container is placed under the open end of conduit **112** of mixing nozzle **54.** When the cup **114** is positioned, the person desiring to obtain the mixed product from the dispenser merely pushes button **13** of the appropriate product. This in turn activates electric motor **56** which causes the driving of gears **60, 62** and **64.** The pump assembly **52** is thereby activated to rotate shaft **66** which causes helical thread **68** to operatively engage disposable flexible conduit **18.** Consequently, the concentrate from container **12** is forced through the conduit **18** in peristaltic fashion and delivered to conduit **98** of nipple **96.** Simultaneously, diluent material flows from a supply (not shown) into the adjustable valve structure **100** through conduits **102** and **110** and about valve element **104.** Accordingly concentrate from conduit **18** and diluent from valve **100** enters the lower portion of conduit **98** which comprises the mixing area of the nozzle **54.** After being mixed in proper proportions the product flows through conduit **112** into container **114** which has been properly placed by the operator of the dispenser.

It will thus be seen that the objects set forth above among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above article without departing from the scope of the invention it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Now that the invention has been described,

What is claimed is:

**1.** A dispenser of the type designed to mix liquids of different densities, said dispenser of the type designed to mix liquids of different densities, said dispenser comprising:

a. a removably mounted dispensing container;

b. a pump assembly positioned in communicating relation with said dispensing container;

c. conduit means attached to said dispensing container and positioned to operably engage said pump assembly, said pump assembly is mounted to be movable into and out of operable engagement with said conduit means, such that said dispensing container and said conduit means are removable from said dispenser and

d. mixing means for combining the liquids prior to dispensing:

said pump assembly comprising a rotatable shaft including a flange substantially helically mounted about the periphery thereof and, a backup plate operatively positioned to engage said conduit means in supporting relation thereto; said shaft and said backup plate being pivotally mounted so as to be movable into and out of operative engagement with said conduit means; said flange arranged to continuously depress successive portions of said conduit means during rotation of said shaft, whereby liquid from said dispensing container is forced through said conduit means.

**2.** A dispenser as in claim **1** wherein said dispenser further comprises movably mounted piercing means positioned adjacent said dispensing container and serving to puncture said dispensing container when operatively positioned within the dispenser.

**3.** A dispenser of the type designed to mix liquids of different densities, said dispenser comprising:

a. a removably mounted dispensing container;

b. a pump assembly positioned in communicating relation with said dispensing container;

c. Conduit means attached to said dispensing container and positioned to operably engage said pump assembly, and

d. mixing means for combining the liquids prior to dispensing:

said mixing means comprising a valve assembly for adjustably regulating the flow of at least one of said liquids and nozzle means positioned in communicating relation with both said valve assembly and said dispensing container; said valve assembly comprising a valve seat and a valve element adjustably mounted within said assembly in cooperating relation to said valve seat; said valve assembly positioned in communicating relation to a source of said one liquid; whereby the flow of said one liquid is regulated by said valve assembly dependent upon the rate of flow of at least one other liquid through said nozzle means.

**4.** A dispenser as in claim **3** wherein said valve element is threadedly connected within said valve assembly so as to be adjustably positioned relative to said valve seat.

**5.** A dispenser as in claim **3** further comprising an orifice arranged in intercommunicating relation between said valve assembly and said nozzle means, said orifice being of sufficient size to form a jet flow of said one liquid into said nozzle means, said nozzle means comprising a first channel defining the flow of another of said liquids, said orifice arranged substantially perpendicular to said first channel, whereby turbulence is created by the joining of said one liquid to said other liquid.

**6.** A dispenser as in claim **3** wherein said nozzle means comprises: a first flow defining channel, a second channel communicating with said first channel and arranged substantially perpendicular thereto, whereby turbulence is created by a flow of liquid from said first channel to said second channel.

**7.** A dispenser of the type designed to mix liquids of different densities, said dispenser comprising:

a. a removably mounted dispensing container;

b. a pump assembly positioned in communicating relation with said dispensing container;

c. conduit means attached to said dispensing container and positioned to operably engage said pump assembly; and

d. mixing means for combining the liquids prior to dispensing:

said pump assembly including a rotatable shaft, an outwardly extending flange helically arranged along the periphery of said shaft and a backup plate positioned in cooperating relation to said shaft, said shaft and said backup plate movably mounted relative to said pump assembly so as to move said shaft and said backup plate into and out of operative relation to each other.

**8.** A dispenser as in claim **7** wherein said pump assembly further includes unclamping means comprising a reciprocally mounted plate positioned to move said shaft and said backup plate into and out of operative engagement with said conduit means.

* * * * *

# UNITED STATES PATENT OFFICE

# CERTIFICATE OF CORRECTION

Patent No. 3,750,908 Dated August 7, 1973

Inventor(s) Carl C. Bauerlein et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 7, line 36, after "where" insert -- proper --.

Signed and sealed this 17th day of September 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P6
★ U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-3