

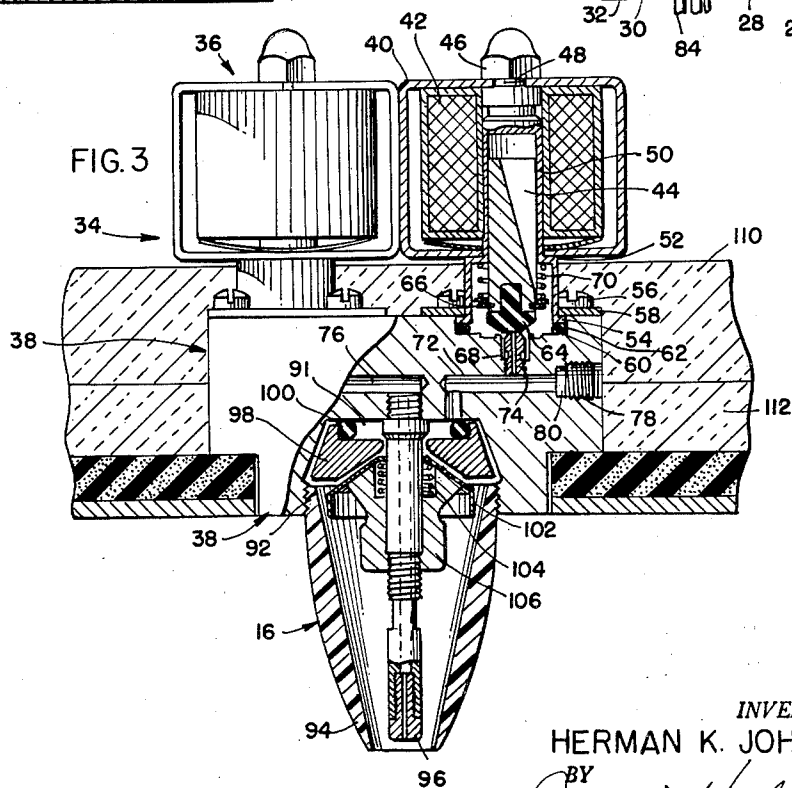
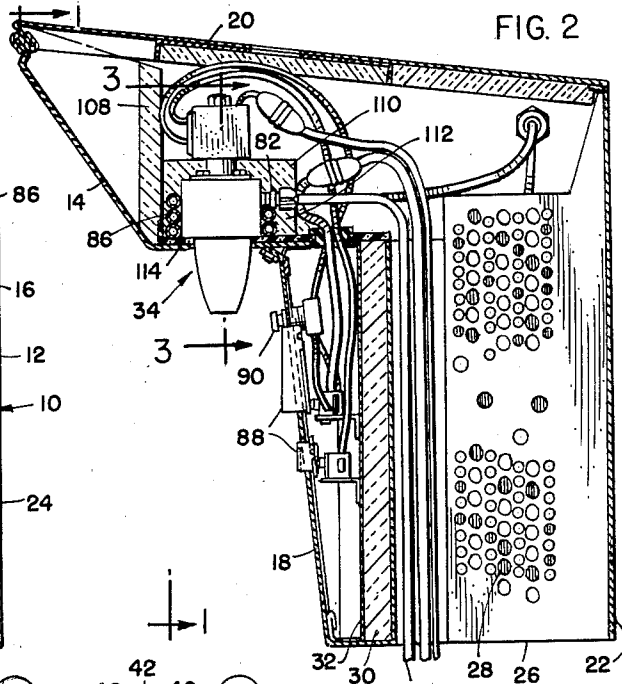
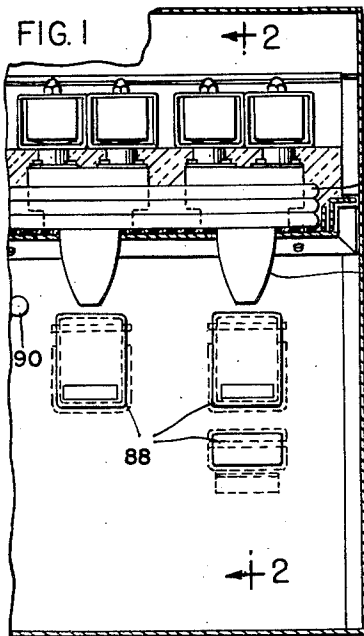
Dec. 25, 1962

H. K. JOHNSON

3,069,871

DRINK DISPENSER

Filed Sept. 12, 1960



INVENTOR:

HERMAN K. JOHNSON

BY

Herman K. Johnson

ATT'Y

1

3,069,871

DRINK DISPENSER

Herman K. Johnson, Grand Haven, Mich., assignor to The Bastian-Blessing Company, Chicago, Ill., a corporation of Illinois

Filed Sept. 12, 1960, Ser. No. 55,213

11 Claims. (Cl. 62—390)

This invention relates to an apparatus for dispensing of refrigerated liquids such as soda water, plain water and syrup in various combinations to provide plain and mixed drinks at a fountain. This application is a continuation-in-part of my filed case, Serial No. 683,758, now Patent No. 3,009,337, and relates in part also to Patents Nos. 2,657,952 and 2,674,263, reference to which is hereby made for better understanding of this invention.

Soda fountains and other installations employ draft arms to handle the different beverages served and are usually grouped at one location or station where suitable supply connections and drain facilities can be arranged. Heretofore, the draft arm stations have included draft heads, including valves and conduits therein, not only subject to the warmth of the surrounding atmosphere, but all of the exposed surfaces are carefully contoured, finished and polished to provide a pleasing appearance at a substantial expense. In many instances, the draft arms extend upwardly on the top or counter surface of a cabinet on individual pedestals with a depending nozzle disposed over a drain supported on the cabinet which has a refrigerated storage space in which the cooling coils are disposed. Another instance is one in which the cooling coils for liquid beverage are contained in a housing located above the counter of the cabinet and the draft arm heads are short and extend only a short distance from the housing.

This invention is characterized by an apparatus for dispensing drinks in which all of the ingredients of the drink are not only cooled in temperature, preferably between 32° F. and 40° F., but this temperature is maintained up to and including the discharge port of all the conduits carrying the liquids, so that the very first drink of a series of drinks drawn is the same temperature as the last drink, regardless of the time element with which they are drawn.

The invention is further characterized by providing liquid control valves adjacent the draft heads rather than at the inlet to a bank of cooling coils for cooling the liquid to be dispensed.

A further object of this invention is to provide refrigerating coils in surface contact with a control valve which is coordinated with and secured to a discharge nozzle assembly whereby the combined unit is substantially reduced in temperature prior to the release of the liquids to be dispensed.

A still further object of this invention is to provide an improved draft head which includes a solenoid operated control valve in coordination with a mixing and nozzle discharge assembly for pre-cooling a liquid.

A further object of this invention is to provide an improved mounting for a plurality of discharge control valves in conjunction with the draft heads in an upper surface of a draft arm station wherein each valve assembly is readily accessible for maintenance and service.

Another object of this invention is to provide an improved draft arm which presents a plurality of outlets for a variety of liquids which are controlled by the actuation of an electrical switch by the touch of the operator's hand while retaining a container for the dispensing liquid in the hand.

A still further object of this invention is to provide an electrical control circuit which is readily actuated from a front panel to de-energize a plurality of actuating

2

switches, whereby maintenance and cleaning of the unit may be completed without dispensing of the liquids by accidental actuation of the switches.

A still further object of this invention is to provide an improved draft arm presenting a plurality of discharge nozzles wherein the control valves and refrigerating mechanism are in a compact unit arranged above a counter surface which is readily accessible for maintenance and is completely enclosed by heat insulating material to increase the cooling efficiency and to prevent the gathering of moisture on the polished external surfaces of the unit.

These being among the objects of the invention, other and further objects will become apparent from the drawings, the description pertaining thereto and the appended claims.

In the drawings:

FIG. 1 is a fragmentary partially sectioned view in front elevation of my invention taken along the line 1—1 of FIG. 2;

FIG. 2 is a partially sectioned view in side elevation of my invention taken along the line 2—2 of FIG. 1; and

FIG. 3 is an enlarged partially sectioned view in front elevation taken along the line 3—3 of FIG. 2 illustrating the combination of solenoid valves in conjunction with a mixing and discharge nozzle assembly.

By way of generalization for a better understanding of the invention and the detailed description that is to follow, the invention related specifically to the arrangement of the controlling elements for a draft arm and particularly to the structure of a solenoid control valve in conjunction with a draft head comprising a mixing and nozzle assembly and its functional operation. As will be readily seen from the drawings, the invention provides a pair of solenoid valves to operate the different assemblies for each dispensing nozzle with the entire bank of solenoid valves, mixing and nozzle assemblies being mounted in the upper structure of the draft arm housing and one so designed that if service is necessary, they are readily accessible for repair. The invention is further characterized by the provision of a plurality of cooling coils about the draft heads which are interconnected with the refrigerant in the heat exchanger section in such a manner that the refrigerant will cool the draft head prior to cooling the liquid to be dispensed. It is also a salient feature of this invention to provide a coordinated switching arrangement interconnected between the plurality of solenoid valves with a single master switch which controls the entire electrical circuit of all the solenoid valves and when in the off position, places the control panel in a de-energized condition whereby an accidental touching of one of the control switches during cleaning would not result in the drawing of a liquid. The coordination between the master switch, the control switches, the plurality of combined draft heads and solenoid valves and the continuous cooling of the units whereby the initial liquid dispensed from the nozzle has attained the desired cooling temperature, are the primary features of this invention.

Referring now to the drawings in detail, a draft station 10 is shown in FIG. 1 which comprises a housing 12 provided with an angular overhang 14 in which is disposed a plurality of depending nozzle assemblies 16. The housing 12 is preferably formed from a thin, highly polished metal, such as stainless steel with an ornamental and pleasing external appearance. As readily viewed in FIG. 2, the housing 12 is so designed to provide an enclosed compartment with an angular overhang 14 which blends with an outwardly slanting front panel 18 and a downwardly sloping upper wall or top 20. A back 22 and side walls 24 are straight and smooth and form right angles with a bottom wall 26. Secured to the bottom wall are

support members and holding brackets, not shown in the drawings, for mounting the housing to a soda counter or such and may be in any desirable, suitable form.

A heat exchanging structure 28, completely surrounded by a heat insulating wall, is mounted in the rearward portion of the housing and is preferably in the form of a plurality of flow tubes in close relationship to one another and so contoured and curved that they provide a compact bank of tubes as illustrated in FIG. 2. Flow through the heat exchanger is the same as in any conventional heat exchanger, that is, the cooling medium or refrigerant flowing in one set of tubes in one direction with the liquid to be cooled flowing in another inner spaced bank of tubes in the opposite direction whereby maximum heat exchange is derived. The inlet and outlet ports for the cooling medium are below the counter surface and are not illustrated in the drawings. Likewise, the inlet for the liquid to be cooled is below the counter surface with the outlet for this liquid leading directly from the heat exchanger to a mixing valve mounted adjacent the nozzle 16. It being understood of course, that each different liquid to be dispensed has a separate bank of flow tubes inner spaced with the tubes carrying the cooling medium.

The top 20 and the side walls 24 are lined with an insulating material similar to the material used for the heat exchanger 28 and the back wall 22. Directly behind the angular front panel 18 is an intermediate wall 30 which provides parallel outer walls 32 having a similar heat insulating material therebetween. Thus, as readily viewed at FIG. 2, the cooling coils, the liquid lead lines and valves, a detailed explanation of which is to follow, are substantially enclosed in an insulated compartment to provide shielding from external heat and humidity. This arrangement not only provides the advantage of increasing the cooling efficiency of the unit but eliminates the formation of moisture on the outer finished surface of the housing.

Referring now to FIGS. 2 and 3, a plurality of solenoid operated mixing valves or draft heads, indicated generally by the numeral 34, are equally spaced and detachably secured to an under surface of the over-hang portion 14 in such a position as to present each of the depending nozzles in alignment with draining facilities and a plurality of actuating switches mounted in the angular front panel 18. The head 34 is composed of three main sections, a solenoid valve section 36, a mixing body 38 and the lower depending nozzle assemblies 16.

The solenoid section 36 provides a cover 40 which encloses a coil 42 which in turn encircles a reciprocating plunger 44. The coil and cover are secured in position by a locking nut 46 which engages an upward extending threaded portion 48 of a center post 50 of the solenoid. The center post 50 increases in diameter near the lower end thereof at a point 52 with a flange portion 54 protruding outwardly at its lowermost extremity. The solenoid is secured to the mixing body 38 by four screw members 56 which engage a hold-down plate 58. The plate 58 is forced downward by the screws 56 against the flange 54 which is continually urged in an upward direction by a resilient sealing ring 60 disposed in a recess 62 in the upper surface of the mixing body 38.

The plunger 44 is free to reciprocate within the center post 50 and carries a sealing member 64 on its lowermost end. As readily viewed in FIG. 3, the sealing member 64 is embedded in the end of plunger 44 and provides an angular surface extending from the maximum diameter of the plunger downwardly and inwardly to a flat surface having a substantially smaller diameter which provides a sealing surface for engagement with a flow orifice in the mixing body 38. The plunger 44 is forced in the downward or closed position by a compression spring 70 which has one end against a shoulder formed by the increase of diameter of the center post at 52 and the other end pressing against a split ring 66 disposed in the plunger shaft slightly above the end thereof carrying the sealing member 64. Each of the four valves 34 may be provided with

two separate solenoid sections 36, each controlling the flow of a different liquid.

The mixing body 38, formed from a non-corrosive metallic material, provides not only the recessed areas 62 in the upper surface for receipt of the solenoid sections but provides a plurality of flow passages to interconnect the fluid flow lines from the source of supply with the discharge nozzles. Each of the recessed areas 62 has an opening 68 centrally located therein which interconnects an inlet flow passage to a flow passage 72 leading to the discharge nozzle. The opening 68 is threaded about its lower portion adjacent the juncture thereof with the flow passage 72 and a flow orifice 74 is threadably engaged therein which presents an upper surface for sealing engagement with the sealing member 64. The passage 72 terminates at a point above the nozzle assembly 16 for flow of one of the liquids, with a similar passage 76 interconnecting the source of another liquid with a flow stem in the nozzle assembly 16. The nozzle assembly 16 is of similar structure and function as disclosed in my Pat. No. 3,009,337, reference to which is incorporated herewith to readily clarify the many parts of this assembly. Primarily, the nozzle assembly 16 provides a downwardly facing cavity 91 defined by an internally threaded wall 92 which threadably receives the upper end of a nozzle shield 94. Centrally located in the nozzle assembly is a flow stem 96 which threadably engages the mixing body at the termination point of the flow passage 76. Encircling the stem 96 is a collar 98 that has a flange seal 100 on its upper surface engaging the mixing body 38 in sealed relationship around the cavity 91. Positioned below the collar 98 is an umbrella guide 102 which nests with the collar. The guide 102 is held in place by a compression spring 104 and a lock-nut assembly 106. It being readily understood that there is no flow through the nozzle assembly of either liquid until the plunger 44 is raised to the open position permitting flow from the recess 62 through the flow orifice 74.

Each of the flow passages 72 and 76 is sealed from leakage through the openings formed during the machining thereof by plugs 78 which threadably engage the body 38 and are provided with a suitable sealing member 80, such as a conventional O-ring. Each of the inlet ports provide a standard fitting 82 which is adapted for joining a thin walled conduit 84 which provides a flow passage for the liquid from the source of supply to the recess 62 in the mixing body 38.

From the foregoing description and as readily viewed in FIG. 3, it is apparent that the position of the solenoid valve will control the flow of the liquid and that a mixture of the two liquids is readily attained as the separate flows are joined and discharged through the nozzle. It being understood of course that the description and drawings have disclosed the control of two liquids to be dispensed at one time but the invention also contemplates the control of any number of liquids in this manner to be dispensed at one time from one nozzle.

Referring now to FIGS. 1 and 2, cooling coils 86 are formed around the draft heads 34 and are secured thereto in surface to surface contact to effect the maximum heat transfer from the valve to the cooling coils. The coils are interconnected with the heat exchanger in such a manner that the refrigerant passes through the coils 86 before passing through the heat exchanger 28 to cool the liquid to be dispensed. Thus, the very first drink dispensed will be at the desired temperature, approximately 40° F., without the previous time delay for the liquid to cool sufficiently to insure the proper temperature by the time it reaches the discharge nozzle.

A rigid block 108 of insulating material is contoured to fit over and about the forward half of the mixing body and the cooling coils and extends upward to the insulating material of the upper wall 20. The rearward half of the mixing body and cooling coils is similarly covered by insulating material. Two separate pieces 110 and 112 are utilized to facilitate assembly of the valve

unit and the placement of the insulating material. A flat piece of insulating material 114, having openings for receipt of each of the depending nozzles 16, is positioned below the mixing body 38 and cooling coils 86 whereby a complete enclosure of insulating material is formed around the coils and mixing body. This additional insulating material besides increasing the cooling efficiency essentially eliminates the formation of harmful condensation in this area.

Still referring to FIGS. 1 and 2, a plurality of control switches 88 are mounted on the front panel 18 and so arranged and interconnected to control the position of the plunger 44 of the solenoid 36 and are pivotally secured to the front panel for engagement with any suitable conventional micro-switch. As disclosed in my Pat. No. 3,009,337, each switch 88 is mounted in alignment with one of the nozzles to permit an operator to hold the container and dispense the liquid with one hand. Centrally mounted on the front panel is a push button switch 90 which is wired in series with power inlet lines leading to the control switches 88 and serves as a master switch whereby the control switches may be completely de-energized when cleaning or servicing the unit. If the circuit for switches 88 is not de-energized there would be a splurge of drinks whenever a porter or service man accidentally touches one of the control switches.

From the foregoing description it is readily apparent that the invention provides an arrangement and structure for the many component parts whereby the liquid dispensed is maintained at a constant temperature at all times and that the first drink dispensed will be the same temperature as the next drink, regardless of the rapidity at which the drinks are drawn. The invention further provides the cooling of the mixing and controlling valves prior to the liquid to be dispensed. Furthermore, the arrangement and interconnection of the many valves and switches provide ease of operation and permits complete safety during a servicing or cleaning operation by other than trained operators. Moreover, the mixing control valve combination provides an increased positive flow control which insures the same flow and mixture of the liquids each time since the solenoid either is in the extreme upward or downward position to positively seal off or open up the inlet flow orifices.

Consequently, it is apparent from the description and the drawings relating thereto how the objects of this invention are attained and to those skilled in the art it will be readily apparent how various modifications and changes can be made without departing from the spirit of the invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. In combination, a liquid conduit and a first portion of a refrigeration coil disposed in heat exchange relationship therewith to maintain the liquid at a predetermined temperature, a mixing body, a solenoid valve in said conduit, means supporting the solenoid valve in interconnecting relationship with the mixing body, a nozzle depending from the mixing body, said mixing body connected to the outlet of said liquid conduit, a second portion of said refrigeration coil in surface contact with the mixing body, said second portion of said refrigeration coil interconnected with the first portion of the refrigeration coil whereby the refrigerant passes through the second portion before the first portion, and means to operate said valve to permit flow of the liquid through the mixing body and out the depending nozzle.

2. In combination, a liquid conduit and a first portion of a refrigeration coil disposed in heat exchange relationship therewith, a mixing body, a solenoid valve in said liquid conduit, means supporting the mixing body and the solenoid valve in interconnected relationship, an L-shaped housing including a heat insulating material enclosing said liquid conduit and first portions of the refrigeration coil, said mixing body and solenoid

valve being detachably secured in the overhanging portion of the L-shaped housing, a nozzle depending from said mixing body, a second portion of said refrigeration coil in surface contact with said mixing body, said second portion of the refrigeration coil and mixing body being encased by a heat insulating material, said mixing body connected directly to the outlet of the liquid conduit, said second portion of the refrigeration coil interconnected with said first portion of the refrigeration coil whereby refrigerant flows through the second portion prior to flow through the first portion, and a control switch mounted on the housing to position the solenoid valve permitting the liquid to flow through said liquid conduit and be dispensed from the nozzle.

3. In combination, a liquid conduit and a first portion of a refrigeration coil in heat exchange relationship therewith to maintain said liquid at a predetermined temperature, a draft head connected directly to the outlet of said conduit, an L-shaped housing including a heat insulating material enclosing said coil, conduit and draft head, a nozzle depending from the draft head, a pair of on and off valves connected to said conduit and disposed on said draft head, a second portion of said refrigerating coil received about the draft head in heat transfer relationship, and a control switch mounted on the housing for actuating said on and off valves to permit flow of said liquid.

4. A liquid draft station comprising an L-shaped housing having a substantially vertical portion and lateral portion at the top thereof, a mixing body detachably secured to the under surface of said lateral portion, a heat exchange unit secured in the rearward portion of said vertical portion, said heat exchange unit comprising a first liquid conduit and a first portion of a refrigeration coil, outlet of the first liquid conduit from the heat exchanger connected directly to said mixing body, a second liquid conduit interconnecting a liquid supply source directly with said mixing body, a nozzle depending from the mixing body, a pair of solenoid valves interconnected with and mounted on said mixing body, a second portion of the refrigerating coil secured in surface contact with the mixing body, said second portion of the refrigerating coil interconnected with said first portion of the refrigerating coil whereby the second portion receives the refrigerant first to cool said mixing body, a pair of actuating switches mounted on the housing each controlling one of said solenoid valves which permits flow of the liquids through the mixing body and out the nozzle at a predetermined temperature, and a control button centrally mounted on the housing between said actuating switches, said control button interconnected with each of said actuating switch whereby the circuit to the solenoid valves may be de-energized to facilitate cleaning and repair of the draft station.

5. The combination called for in claim 4 whereby both of the solenoid valves are controlled by one actuating switch.

6. The combination called for in claim 4 whereby the mixing body and a portion of the refrigerating coil are encased in heat insulating material.

7. The combination called for in claim 4 whereby there is a plurality of mixing bodies secured in the under surface of the lateral portion of the housing and each of said mixing bodies have a pair of solenoid valves secured thereto.

8. In a liquid dispenser, a draft head having a first and second passageway therethrough, means for dispensing syrup through said first passageway including a flow metering device accessible at said head, a first liquid conduit leading to said first passageway, means for dispensing carbonated water through said second passageway including a second liquid conduit having its outlet connected to said second passageway, a pair of solenoid valves detachably secured to said draft head, each normally closing one of said passageways, means for refrig-

erating said second liquid conduit and said draft head, means for operating said solenoid valves simultaneously, and means for insulating said draft head and conduits from contact with ambient atmosphere.

9. In combination with a soda fountain, a draft station including a housing having an overhanging projection, a plurality of draft heads mounted in said housing within said projection and including mixing bodies and nozzles depending therefrom, water conducting coils within the housing with their outlets connected to said mixing bodies, refrigerating means for cooling said water conducting coils and said mixing bodies including refrigerating coils and insulating material surrounding said mixing bodies and said water coils, syrup conduits insulated from said refrigerating means and connecting with said mixing bodies, solenoid valves secured to each of said mixing bodies to control the flow of water and syrup therethrough, and actuating switches carried by said housing below the projection for operating the solenoid valves at a level in close proximity to said nozzles.

10. In combination with a soda fountain, a draft station including a housing having an overhanging projection, a plurality of mixing bodies mounted in said housing within said projection and including nozzles depending therefrom, water conducting coils within the housing with their outlets connected to said mixing bodies, refrigerating means for cooling said water conducting coils and said mixing bodies including refrigerating coils and insulating material surrounding said mixed bodies and said water coils, syrup conduits connected with said mixing bodies, solenoid valves secured to each of said mixing bodies to control the flow of water and syrup therethrough, actuat-

ing switches carried by said housing below the projection for operating the solenoid valves at a level in close proximity to said nozzles and a control button centrally mounted on said housing between said actuating switches, said control button interconnected with said actuating switches to de-energize the circuit to each of said solenoid valves to facilitate repair and cleaning of the draft station.

11. In combination, a first liquid coil and a first portion of a refrigeration coil in heat exchange relationship, a draft head connected to the outlet of said first liquid coil, second portion of said refrigeration coil secured about the draft head in surface to surface contact, said second portion of the refrigeration coils interconnected with said first portion of the refrigeration coils to receive the refrigerant first to cool the draft head, an L-shaped housing including a heat insulating material enclosing said coils and draft head, a second liquid coil interconnecting a liquid supply source directly with the draft head, a nozzle depending from the draft head, a pair of on and off valves connected on said draft head, and a control switch mounted on the housing for actuating said on and off valves to permit flow of the liquids.

References Cited in the file of this patent

UNITED STATES PATENTS

2,327,910	Levine	Aug. 24, 1943
2,362,104	Smith	Nov. 7, 1944
2,814,184	Johnson	Nov. 26, 1957
2,934,243	Metzger	Apr. 26, 1960