March 13, 1962 J. A. SKURNER 3,024,984

HAND COMPUTER

Filed Dec. 10, 1959

FIG.2

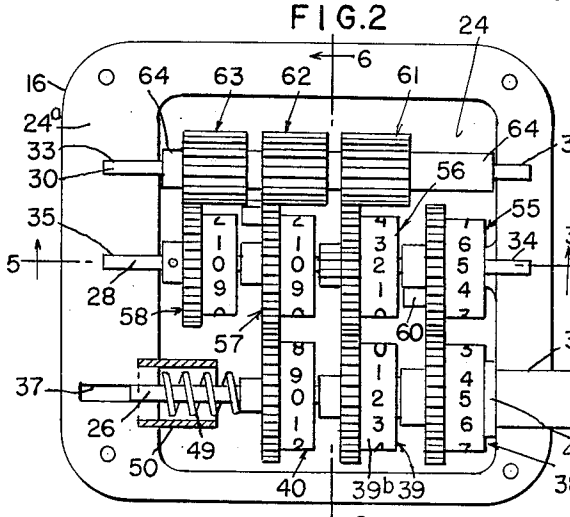


FIG.1

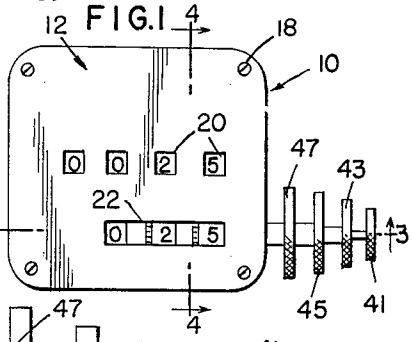


FIG.3

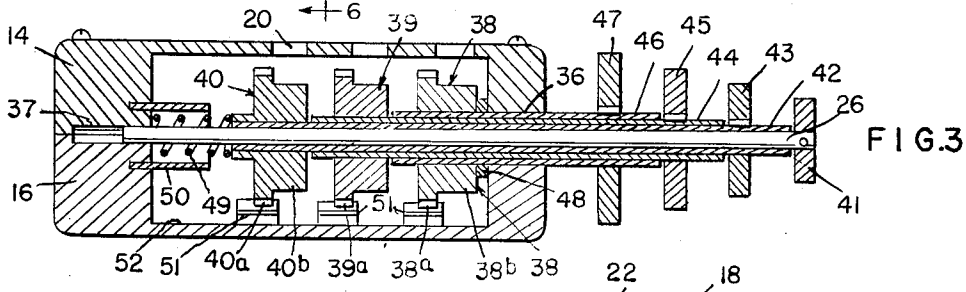


FIG.4

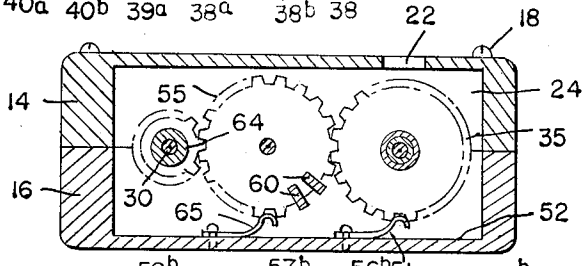


FIG.5

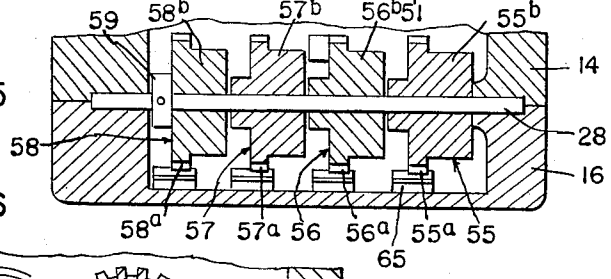
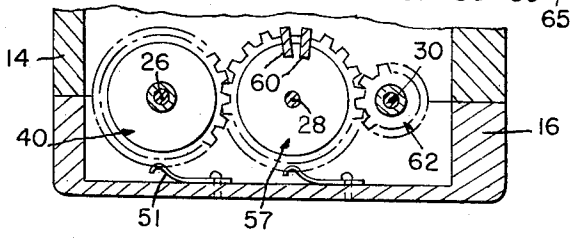


FIG.6



INVENTOR.
John A. Skurner
BY
Shoemaker & Mattare
ATTYS.

United States Patent Office 3,024,984
Patented Mar. 13, 1962

3,024,984
HAND COMPUTER

John A. Skurner, 2322 3rd Ave., Altoona, Pa.

Filed Dec. 10, 1959, Ser. No. 858,617
8 Claims. (Cl. 235—80)

This invention relates broadly to computing devices and more specifically to a record keeping computer of small size which can be carried in the hand.

This application is a continuation-in-part of application Serial No. 810,325, filed May 1, 1959.

Many persons, particularly housewives who keep a careful budget when marketing, desire to keep their purchases within a certain range for each marketing trip and accordingly it is essential that as they select various items they note the individual costs and more or less compute the total they are accumulating as they go along. Unless some mechanical means is convenient for keeping track of and totalling individual purchases, this can be very difficult.

It is accordingly a particular object of the present invention to provide a small computing device which can be either carried in the hand or attached to the basket of the cart which they are using in picking up their goods, by means of which as each item is selected the price thereof can be added to the total of prices for previously selected items so that upon completion of the trip the housewife can see exactly how much money she is going to have to spend or, if she has determined on a limit for expenditure on that trip, she can see when that limit has been reached.

Another object of the invention is to provide a computer device of the character described, which is very easily actuated and which can be easily and quickly re-set to zero position for the counting wheels or cylinders after the marketing or shopping trip is completed.

Still another object of the invention is to provide a small hand computer employing a series of numbered wheels which can be actuated to show the unit prices of articles selected and which upon such actuation will transfer the unit price to a totalizing series of numbered wheels, after which the numbered wheels or units employed for registering the unit price can be re-set without affecting the total shown on the totalizing wheels, ready for actuation to add another unit price to the accumulated total.

Still another object of the invention is to provide a small hand computer of the character stated which is of extremely simple design and construction; which can be set up and embodied in a housing of metal, plastic or the like in an economical manner and which will operate efficiently and will be strong and durable so as to have a long and useful life.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawing forming part of the specification, with the understanding, however, that the invention is not confined to a strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

FIG. 1 is a view on a small scale of a hand computer constructed in accordance with the present invention, viewing the front or face of the latter which shows an elongate window exhibiting a unit price and windows exhibiting a total;

FIG. 2 is a plan view of the lower part of the device from which the top or cover has been removed and showing the various elements therein;

FIG. 3 is a sectional view taken substantially on the line 3—3 of FIG. 1, and on an enlarged scale;

FIG. 4 is a sectional view taken substantially on the line 4—4 of FIG. 1;

FIG. 5 is a sectional view taken substantially on the line 5—5 of FIG. 2; and

FIG. 6 is a sectional view taken substantially on the line 6—6 of FIG. 2.

Referring now more particularly to the drawing, the numeral **10** generally designates the hand computer device of the present invention. This device, as hereinbefore stated, is intended to be made in sufficiently small size or on a sufficiently small scale that it may be carried conveniently in the hand for manipulation while making purchases in a store.

While there has not been shown in connection with the computer device any means for attaching the same to a support, it is nevertheless within the purview of the present invention to provide any desirable means connected with the casing of the computer device by means of which it may be attached to a basket or carrier in which goods are being collected or to the body of the person using the device, as by means of a wrist strap or the like, or to a part of the user's clothing.

The hand computer is illustrated as being formed of a rectangular box or casing which is generally designated **12** and which is further illustrated as being divided in a plane paralleling the top and bottom faces to form the top and bottom halves designated respectively **14** and **16** which may be detachably secured together in a suitable manner as by means of screws **18** passing through the top half of the casing into the lower or bottom half in an obvious manner.

The box or casing **12** may be formed of metal, plastic or other suitable material and the top half or top portion thereof has a series of windows **20** which are in a row position to show a total registered by the device. An elongate window designated **22** is positioned in parallel relation with the row of windows **20** and this window **22** overlies indicator elements within the box which, upon manipulation, will show the unit prices of selected articles.

It will, of course, be understood that while the box or casing **12** has been divided horizontally in two equal parts, this is a convenient and preferred arrangement, but it is not limiting in any way as it will be obvious that the box or casing may be constructed in other suitable ways whereby it can be opened to give access to the interior thereof.

The box or casing is constructed to provide an interior chamber which is generally designated **24** and in which various gear wheels and number cylinders or drums and other elements are located.

Referring now to FIG. 2, in which the lower section **16** of the box or housing is shown with the top half removed, it will be seen that there are disposed transversely of the chamber **24** three parallel shafts designated **26**, **28** and **30**. Any suitable means may be employed for rotatably or slidably supporting these shafts as required, but in the illustration of the invention as here presented, the edge faces of opposite walls are formed, for the shafts **28** and **30**, with semi-circular recesses in which the end portions of the shafts rest. For example, the edge face in question of the bottom portion is designated **24***a* and it will be understood that a corresponding edge face for the top portion will fit against this face when the two box portions are secured together and this edge face **24***a* is provided at one side of the chamber with the semi-circular bearing recesses **32** and **34** while at the opposite side of the chamber **24** the edge face of the lower portion is provided with the semi-circular channels **33** and **35**, which channels receive ends of the shafts **30** and **28** respectively, as shown, the opposite ends of

such shafts being respectively seated in the recesses 32 and 34.

It will, of course, be understood, although the same is not illustrated, that the edge face of the upper portion 14 will have corresponding semi-circular bearing recesses and channels to receive the ends of the shafts when the top portion is secured to the bottom portion of the box.

Also formed in the edge face 24*a* at opposite sides of the chamber 24 is a transversely extending slot 36 and at the opposite side of the chamber and in alignment with this slot is a socket 37. The function of this slot 36 and socket 37 will now be described.

The shaft 26 supports a series of unit counter wheels which are designated 38, 39 and 40, each of which comprises a gear 38*a*, 39*a* and 40*a*, and a number carrying drum 38*b*, 39*b* and 40*b*. Each of these drums has a series of numbers, zero to 9, around the surface thereof as shown in FIG. 2.

The shaft 26 carries a head 41 on the right hand end thereof and encircling this shaft is a sleeve 42 which at its outer end is adjacent to the inner side of the head 41 and at its inner end is attached to the drum and gear wheel 40.

Inwardly from the head 41 the gear wheel operating sleeve 42 has secured thereto the knurled wheel 43 by means of which rotation may be imparted to the unit 40 when desired.

The sleeve 42 is encircled by a sleeve 44 the outer end of which is adjacent to the gear operating wheel 43 and inwardly from the outer end of this sleeve there is secured to the sleeve the operating wheel 45 which turns through the medium of the sleeve 44 the middle drum and gear unit 39 which such sleeve 44 carries adjacent to its inner end. A short portion of the inner end of the sleeve 44 projects beyond the unit 39 as shown to maintain the units 39 and 40 in spaced relation.

Encircling the second sleeve 44 there is a third sleeve designated 46, one end of which is opposed to the inner side of the wheel 45 and adjacent to this end this third sleeve 46 carries a wheel 47 which through the medium of the sleeve 46 may be manipulated to turn the gear and drum unit 38 which is fixed to the sleeve 46 adjacent to the inner end of the latter and a portion of such inner end of the sleeve 46 projects beyond the unit 38 to maintain a spacing between this unit and the unit 39.

Means is provided for maintaining the unit 38 spaced from the adjacent wall of the chamber 24, such means here being shown as a collar 48 which encircles the larger one of the sleeves 46.

The inner end of the shaft 26 is slidably engaged in the socket 37 and encircling the inner end portion of the shaft 36 is a compression spring 49 which is in expanded condition between the innermost unit 40 and the adjacent wall of the chamber 24 and constantly urges all of the units 38, 39 and 40, as well as the shaft 26, outwardly or to the right of the structure as it is illustrated, and this outward movement is, of course, limited by the sleeve 48.

For the purpose of limiting the inward movement of the units 38, 39 and 40 in certain operations of the computer, there is provided a movement limiting tube 50 which is fixed to the wall of the chamber 24 nearest to the unit 40 and encircles a portion of the spring 49 and of the shaft 26. Where the box or housing is divided equally into the two parts here shown and described, this tube 50 may be longitudinally divided in two sections, one being secured in the wall of the chamber in the lower part or section 16 while the other half may be carried by or secured in the upper section 14 so that when the two sections are secured together the two parts of the tube will join to form a complete guide tube.

The units 38, 39 and 40 constitute the counters or indicators for unit prices of the articles purchased.

In order to maintain the gear and drum units 38, 39 and 40 against unintentional rotation there are provided three spring ratchets each of which is designated 51 and is secured on the floor 52 of the chamber 24. Each of these spring ratchets is in a position to engage the teeth of an adjacent gear 38*a*, 39*a* or 40*a*.

Supported in spaced relation upon the shaft 28 is a series of totalizing units here shown as four in number and designated 55, 56, 57 and 58 and each of these totalizing units is formed, preferably in one piece as shown in FIG. 5, to provide a gear 55*a*, 56*a*, 57*a* and 58*a* and a number bearing drum 55*b*, 56*b*, 57*b* and 58*b* and, as shown, the units 55, 56 and 57 have short hubs which separate them from the adjacent units. A collar 59 encircles the shaft 28 adjacent to the innermost or left hand side of the totalizing unit 58 and maintains all of the units in assembled relation on the shaft.

The primary units 38, 39 and 40 have the gears thereof meshed with the gears of the totalizing units 55, 56 and 57 whereby rotation of any one of the primary units will impart corresponding rotation to the totalizing unit in connection therewith.

The gear of each of the totalizing units 55, 56 and 57 includes a pair of elongate tooth members which project laterally to the left of the unit and thus form two offset teeth 60 which also project radially to engage a totalizing unit advancing gear, which latter gear when turned advances the next totalizing unit to the left. Each pair of teeth 60 operates upon a complete revolution of the unit of which it forms a part, to actuate a means for advancing the next totalizing unit. The means by which the totalizing units are successively advanced by the teeth 60 comprises the three idler or free rotating long gear elements each designated 61, 62 and 63. These long gear elements are supported on shaft 30.

Each of the gear elements 61, 62 and 63 is located so that when a totalizing unit completes one full revolution the teeth 60 carried thereby will engage the next long gear to the left and rotate such gear a sufficient distance to turn the next totalizing unit one step whereby to bring into exposed position beneath a window opening 20 the next number on the drum of the totalizing unit.

It will be seen upon reference to FIG. 2 that the long gear elements 61, 62 and 63 are maintained in proper position by spacing collars 64 carried by the shaft 30, and that the teeth of the first or right hand gear 61 mesh with the gear 56*a* of the second one of the totalizing units which is designated 56.

The left hand one of the totalizing units which is designated 58 does not carry teeth 60 since there is no next long gear element for it to operate upon.

In the operation of the computer the primary units and the totalizing units are all set to show a zero through the windows beneath which they lie. Assuming now that the first item to be registered on the totalizer costs 25¢, the user of the device rotates wheel 45 clockwise to bring the number 2 under the first or left hand window opening 22 and then rotates the wheel 47 to bring the number 5 on the drum of unit 38 beneath the next window 22 to the right of the one showing the 2. The rotation of the gears 39*a* and 38*a* will thus impart counter-clockwise rotation to the totalizing units 56 and 55 with which they are connected so as to bring up the figures 2 and 5 for exposure through the two right hand window openings 20 as shown in FIG. 1.

The head 41 of the shaft 26 is then pressed toward the left and against the resistance of the spring 49 to disengage the gears 38*a*, 39*a* and 40*a* from the gears 55*a*, 56*a* and 57*a* and reverse rotation is then given to the wheels 45 and 47 to bring the zeros back beneath the window 22. Release of the head 41 will then permit the spring 49 to return the primary units to their original position and re-mesh the gears thereof with the adjacent gears of the totalizing units.

If a second article is now selected which has the unit price of 25¢, the operation just described is repeated. Upon rotation of the wheel 45 to the point where the

number 2 is again brought into exposed position through the window **22** at the second position from the right, the second totalizing unit from the right will be turned two points bringing up the numeral 4 beneath the second window **20** from the right. Now rotation of the wheel **47** until the numeral 5 is exposed through the right hand end of the window **22**, will effect an additional five point rotation to the totalizing unit **55** with which it is coupled, thus bringing a zero into view through the right hand one of the windows **20**. Simultaneously with the rotation of the totalizing unit **55** to bring the zero into position, the teeth **60** connected with the totalizing unit **55** will engage a tooth of the long gear **61**, which gear **61** is in mesh with the gear **56***a* of the second from the right totalizing unit **56** and will rotate this second totalizing unit **56** one point to bring up the numeral 5 to a position where it will be seen through the second from the right window **20**. Thus the totalizing units **55** and **56** will show 50¢ for the two 25¢ purchases.

Now before adding the price of the second purchase to the total shown, the head **41** must again be pressed to the left to disengage the gears of all of the primary units from the gears of the totalizing units so that by reversely rotating the wheels **45** and **47** the numerals can again be turned back to zero and as soon as this is accomplished release of the head **41** will permit the compressed spring **49** to return all of the primary units to their previous positions where the gears thereof will re-mesh with the gears of the totalizing units.

The spring ratchets **51** function at all times to maintain the gears of the primary units in proper position so that the teeth thereof can slide back into toothed connection with the gears of the totalizing units.

In addition to the spring ratchets **51** similar spring ratchets **65** may be provided for engagement with the gears **55***a*, **56***a*, **57***a* and **58***a* of the totalizing units so that these units will always be maintained against accidental movement or rotation at such times that the primary units are disengaged therefrom.

From the foregoing description it will be seen that by repeating the operations stated, the amounts of individual articles selected can be readily added to the total amount shown through the windows **20** so that the user of the device can easily keep track of the amount to be expended for the various articles selected and can accordingly check this amount with the total obtained by the checker at the check-out counter where the goods must be paid for.

After obtaining the sum total of purchases which appear on the totalizing wheels through the windows **20**, resetting of all of the wheels **55**, **56**, **57** and **58** can be accomplished by turning the wheels **47** and **45** counterclockwise until zero registers on the totalizing units **56** and **55**. Then wheel **43** would be turned counter-clockwise a sufficient number of times to bring zero into view on the totalizing units **58** and **59**. A maximum of only 22 turns would thus be necessary to re-set all of the totalizing units or number carrying drums on shaft **28** to zero.

While the invention has been illustrated as employing a pair of the offset teeth **60** for actuating the gear elements **61**, **52** and **63**, it is to be understood that the invention is not limited to the use of dual teeth for this purpose but that a single one of such teeth may be employed if desired, such change, of course, being employed where a smaller number of teeth on the gears **56***a*, **57***a* and **58***a* might be used. In other words, two of the teeth **60** would be employed on each of the gears **55***a*, **56***a* and **57***a* where such gears would have a total of 20 teeth each, but only a single offset tooth **60** would be employed where the gears **55***a*, **56***a* and **57***a* have 10 teeth and in this case the idler gears **61**, **62** and **63** would have 5 teeth each.

What is claimed is:

1. A hand computer comprising a housing having at least one primary window and a parallel row of total exhibiting windows, a row of rotatably mounted primary units underlying said primary window, each unit comprising a numeral drum and a gear, a row of rotatably mounted totalizing units underlying the total exhibiting windows and each comprising a numeral drum and a gear, the gear of each primary unit being meshed with a gear of a totalizing unit, means for selectively individually rotating the primary units to expose a numeral on the drum thereof through the overlying window and for rotating the totalizing units operatively coupled through the gears with the selected primary units, and means for axially shifting the primary units in unison to disengage the gears thereof from the associated gears of the totalizing units for clearing the primary units to restore the same to positions in which zeros are shown through the overlying primary window while maintaining the total produced upon the totalizing unit and exposed through the total exhibiting windows.

2. The invention according to claim 1, wherein the last means comprises axially movable co-axial supporting elements each connected to one of the primary units and adapted to permit such units to be axially shifted to positions of disengagement of the gears thereof from the gears of the totalizing units whereby reverse rotation of the primary units may be effected to effect the clearing thereof.

3. A hand computer comprising a housing having at least one primary window and a parallel row of total exhibiting windows, a first shaft and a second shaft supported in parallel relation within the housing, a series of primary counting units supported for rotation on the first one of said shafts and each comprising a numeral carrying drum and a gear and positioned to have a numeral exposed through the primary window, a series of totalizing units rotatably supported upon the second one of the shafts and each comprising a numeral carrying drum and a gear, the gear of each primary unit being meshed with the gear of a totalizing unit and the drums of the totalizing units each being positioned for the exposure of a numeral thereon through an overlying total exhibiting window, means for selectively individually rotating the primary units to impart corresponding rotation to the totalizing units in geared connection therewith, a tooth member carried by certain of the totalizing units, gear means associated with certain of the totalizing units and having toothed connection with the gears of the associated totalizing units and positioned to be engaged by a tooth of a totalizing unit whereby to rotate an adjacent totalizing unit to a predetermined extent for effecting carry-over of a digit from one totalizing unit to an adjacent one, and means for axially shifting the primary units in unison to disengage the gears thereof from the associated gears of the totalizing units for clearing an amount exhibited through the primary window by the primary units without disturbing a sum exhibited by the totalizing units through the total exhibiting windows.

4. The invention according to claim 3, wherein the means for selectively and individually rotating the primary units comprises coaxial sleeves slidably and rotatably supported relative to one another one within the other and all supported upon said first shaft, each of said primary units being attached to one sleeve only, and a wheel attached to each sleeve by which to turn the same and the attached primary unit.

5. The invention according to claim 4 with a spring ratchet supported by the housing and having operative engagement with the gear of a primary unit for yieldably maintaining the primary unit associated therewith in position relative to the primary window.

6. The invention according to claim 3, wherein the last stated means embodies individual primary unit supporting sleeves slidably telescoped one within the other and each having one primary unit attached thereto, yieldable means for maintaining all of the sleeves and the

primary units thereon in a position of engagement of the gear thereof with the gear of the adjacent totalizing unit, said sleeves all being axially slidable on the first shaft, and means for shifting all of the sleeves and the totalizing units attached thereto axially of the first shaft against said yieldable maintaining means.

7. The invention according to claim 6, wherein said primary unit carrying sleeves extend through and beyond the outer side of one wall of the housing and a wheel secured to each of said sleeves exteriorly of the housing for selectively rotating the primary units.

8. A hand computer comprising a housing having a top wall provided with a first window and a row of windows, the first window constituting a primary units window and the row constituting total exhibiting windows, a first shaft extending through the housing beneath the primary units window, said shaft having one end extending outwardly through and beyond the outer side of a wall of the housing, said shaft being supported for limited axial movement, a plurality of sleeves of varying lengths encircling said shaft and telescoped one within the other for individual sliding movement, a first, second and third primary counting unit within the housing each being supported on and secured to one sleeve to be moved both axially and rotatably therewith, each of said units embodying a numeral carrying drum and a gear, a wheel secured to each of said sleeves exteriorly of the housing for facilitating selective rotation of the units said units and wheels being mounted upon their respective sleeves inwardly of adjacent ends of the sleeves and the portions of the sleeves outwardly of the wheels and of the units forming spacers between the adjacent wheels and units, spring means normally urging the shaft outwardly to an operative position, said first shaft when axially shifted against the force of said spring means disengaging the

gears of said primary units from the gears of said totalizing units for clearing the primary units to restore the same to zero positions, a second shaft within the housing paralleling the first shaft and positioned beneath the row of total exhibiting windows, first, second, third and fourth totalizing units rotatably supported on the second shaft and each embodying a number carrying drum and a gear, the gears of the first, second and third totalizing units being respectively connected with the gears of the first, second and third primary units to be rotated by the latter, at least one tooth member carried by the drum of the first, second and third totalizing units for rotation therewith between the same and the next succeeding totalizing unit, a third shaft in the housing paralleling said second shaft and a first, second and third long gear element on the third shaft, the said first, second and third long gears being in toothed connection respectively with the gears of the second, third and fourth totalizing units and said long gears further being positioned to be engaged respectively by the single teeth of said first, second and third totalizing units, whereby completion of one rotation of the first totalizing unit will transmit a predetermined movement to the second totalizing unit and such movement will be transmitted to the succeeding totalizing units by corresponding action of the single teeth thereof upon the adjacent long gears.

References Cited in the file of this patent

UNITED STATES PATENTS

1,263,339	Pitman	Apr. 16, 1918
1,400,197	Wood	Dec. 13, 1921
2,021,236	Greattinger et al.	Nov. 19, 1935
2,776,795	Ellerbeck	Jan. 8, 1957
2,911,148	Lowell	Nov. 3, 1959