United States Patent

[11] **3,630,010**

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[54] **MULTIUSE MINIBIKE**
5 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **56/13.5,** 56/2, 56/15.8, 172/247
[51] **Int. Cl.** **A01d 35/26**
[50] **Field of Search** 56/25.4, 13.5, 15.8; 172/123, 247; 180/11, 12, 33

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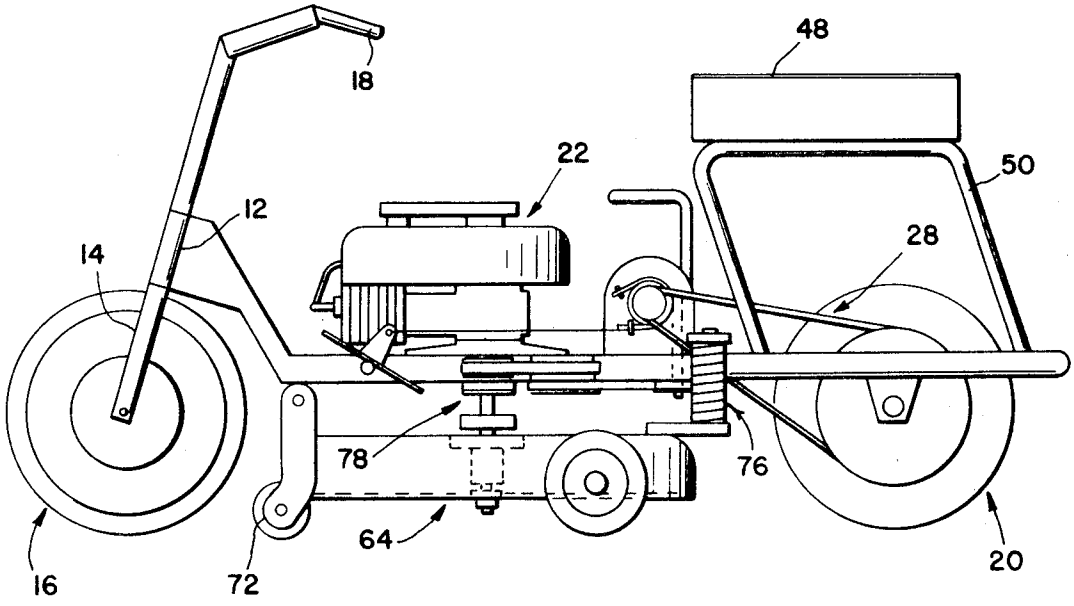
ABSTRACT: A multiple use minibike suitable for road or trail use, and having lawn and soil treating and cutting attachments therefore, together with selectively controllable speed and power transmission drive means for selective driving of the minibike and attachments.



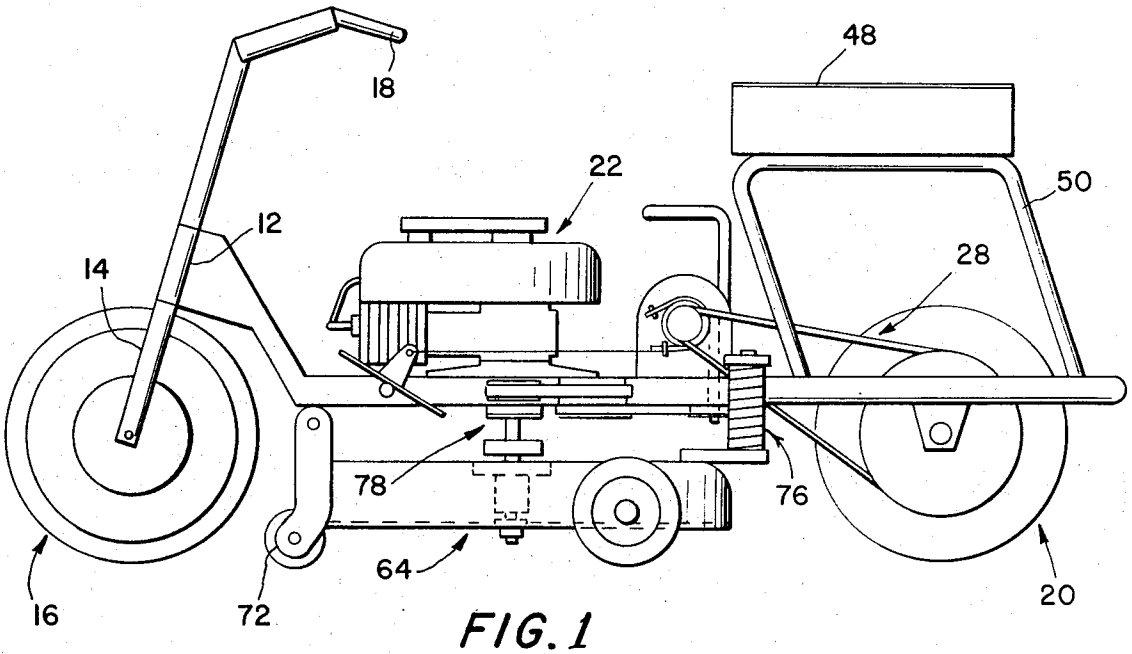


FIG. 1

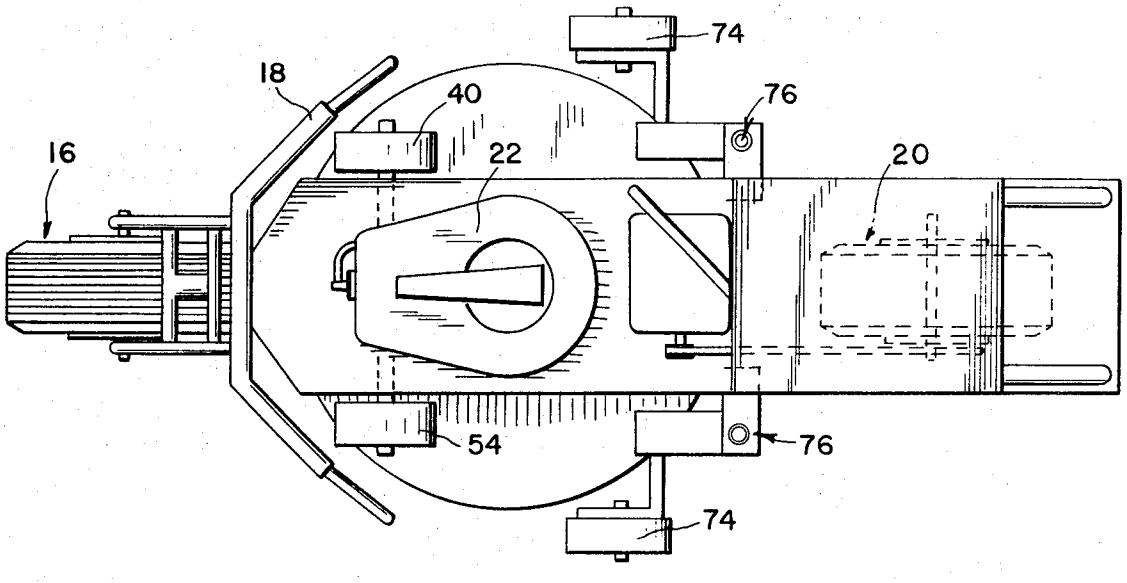


FIG. 2

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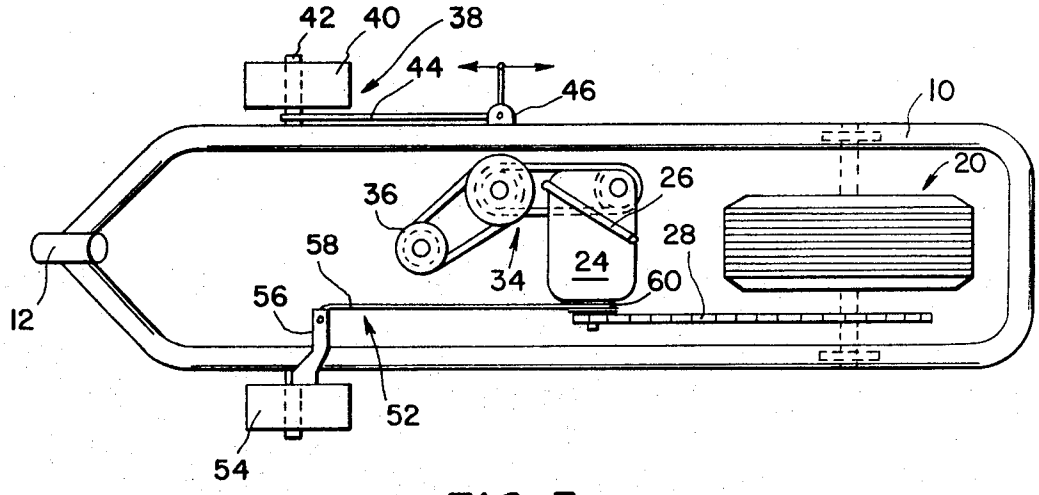

FIG. 3

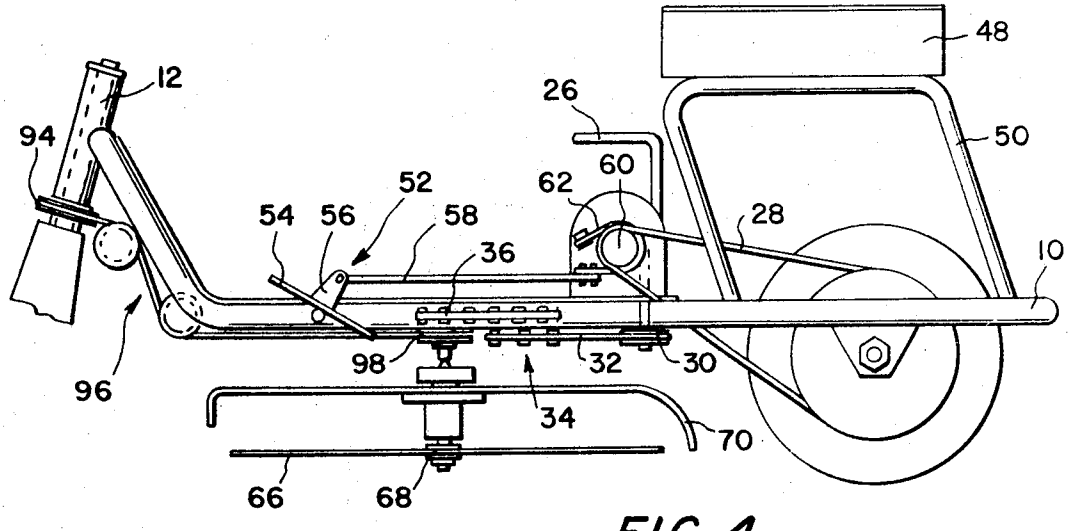

FIG. 4

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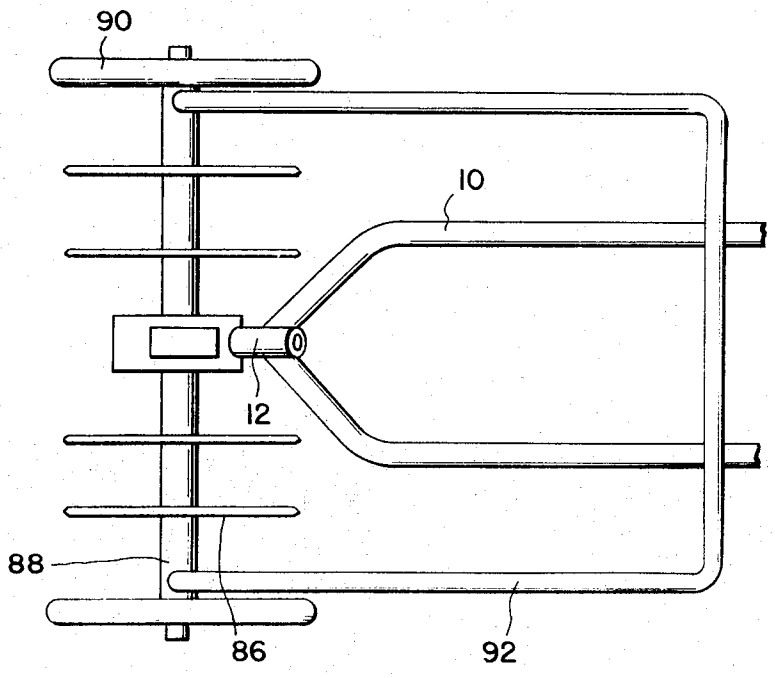

FIG. 5

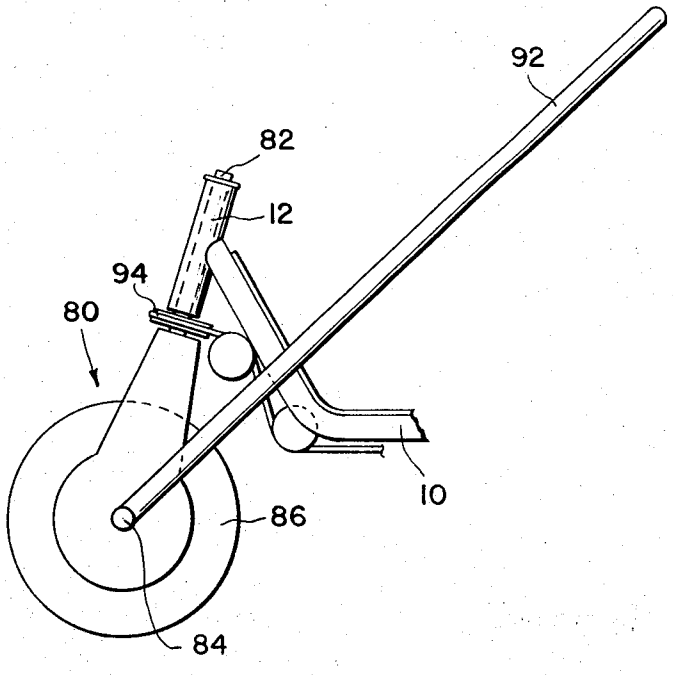

FIG. 6

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MULTIUSE MINIBIKE

BACKGROUND OF THE INVENTION

Mini-bikes are in widespread use of road and trail operation. Lawn mowers of a driven or a riding type are also in widespread use, especially in areas where extensive lawns are maintained. In areas permitting, gardens are frequently planted, and soil preparation and treatment preferably are accomplished by means of power driven tilling machines and the like. The acquisition of separate such machines for each use or purpose is extremely costly and entails multiplication of storage and maintenance capacities and efforts. Each such machine has heretofore been designed and constructed to serve a single purpose, with the accompanying inherent drawbacks enumerated. There exists a desire to eliminate these drawbacks, preferably by incorporation in a single machine of mechanisms to accomplish these various functions, without however detracting from normal usage of the machine for its other purposes. Such a facile and desirable machine has not heretofore been available.

SUMMARY OF THE INVENTION

The present invention is a machine which, with a single basic unit, permits multiple uses by providing a mini-bike construction to which selectively, a lawn mower, a soil tiller, and the like, can be attached with a minimum of effort and time, and wherein the primary function as a mini-bike for road or trail use is not detracted from. The machine incorporates a multispeed reversible transmission driven from the mini-bike motor and interconnecting selectively usable drives therefrom for the bike, mower or tiller and the like. Attachment or removal of the units or components for different uses of the mini-bike is simply and quickly accomplished, and for each use, a highly efficient machine is provided. Costs and maintenance problems are substantially reduced by the present invention.

Additional objects, advantages and features of the invention will be more readily apparent from the following detailed description of an embodiment thereof when taken together with the accompanying drawings in which:

FIG. 1 is an elevational view of a mini-bike in accordance with the invention having attached thereto a lawn mower;

FIG. 2 is a plan view of the vehicle of FIG. 1;

FIG. 3 is a schematic plan view of a mini-bike frame and drive and control means for the bike and attachments thereto;

FIG. 4 is a side elevational view of the structure of FIG. 3 with a lawn mower attachment schematically attachedly shown in driving interconnection;

FIG. 5 is a schematic plan view of a soil tiller attachment for association with the mini-bike frame; and

FIG. 6 is a side elevational view of the tiller mechanism corresponding to FIG. 5.

Referring now more specifically to the drawings the basic mini-bike construction includes an open frame **10** which constitutes the main frame of the bike and which may be selectively constructed of tubing, bar size channel, light angle iron, pressed metal or the like in a known manner. The front end of the frame terminates in a steering post **12** adapted for steerably journaling a fork **14** and a road wheel and tire generally shown at **16**. A usual handle construction **18** is provided. The construction and relationship of the front wheel and steering handle is such that the whole assembly can be quickly removed from or attached to the frame **10** and replaced by an attachment, as will appear hereinafter, in the nature of a soil tiller or the like.

A traction wheel and tire assembly **20** is rotatably mounted on the rear end of frame **10** in a usual manner. A drive motor **22** is secured to the frame and is of a usual type associated with mini-bikes, preferably provided with a recoil starter for example and of a desired horsepower rating as common in the art, such for example as 3 to 10 horsepower.

A transmission **24** is provided and of a controllable type having low, high and reverse operation controlled by shift lever **26**. In the invention this transmission utilizes low and reverse for mower or tiller operation, low speed for operation of the mini-bike as a trail bike and high speed for operation of the mini-bike as a road bike. The transmission is operatively drivingly connected with rear wheel **20** by chain drive **28** or the like from a pulley on the output shaft of the transmission. The transmission is driven through a pulley and belt system including a rear pulley **30** operatively associated with the transmission, a belt **32** entrained around a variable pulley mechanism generally designated **34** driven from and through engine pulley **36** on the output shaft of motor **22**. A toe operated clutch and variable speed control assembly generally designated **38** includes a toe plate **40** rotatably journaled on shaft **42** operatively associated through link **44** with a lever **46** for control of power transmission to transmission **24** through the variable pulley assembly **34**. Details of the clutch assembly are not shown in detail since the actual construction can vary, and details are not necessary to the concept of the invention. The clutch assembly can be spring loaded so as to return to neutral when pressure on the toe plate is released. Utilization of the clutch assembly permits control of engagement and disengagement between the motor and the transmission from zero drive condition to full drive connection by slippage of the belt and pulley arrangement and also permits full engagement or complete disengagement of drive from the motor to the transmission and permits shifting of the transmission to the desired operational condition.

In a usual manner, the mini-bike is provided with a rider seat **48** on stand **50** mounted on the frame. The brake assembly generally designated **52** includes a rotatably mounted toe or foot plate **54** and an offset lever **56** having a rod or lever **58** connected thereto. A V-belt pulley or the like **60** is attached on the output shaft of the transmission around which is entrained a V-belt band section or the like **62** attached to the rear end of rod **58**. Upon actuation of plate **54**, the belt or brake segment **62** is frictionally engaged with the pulley **60** and serves as a brake for the mini-bike. By correlation of controls of the toe plates **40** and **54** in a normal known manner, operation of the mini-bike is readily controlled.

The foregoing described structure is operable as a usual standard mini-bike for road or trail use as will be apparent. In order to permit the unit however to serve at least three different needs of an average family, for example, additional components in the nature of removable attachments are provided. To this end a mower generally designated **64** which, as shown, can be of a rotary type including blade **66** attached to shaft **68** at least partially within protective housing **70** is adapted for mounting on the under side of the frame **10** for driving engagement with motor **22**. The mower construction includes, associated with the frame thereof which is not shown in detail, a small front wheel **72**, preferably pivotable, which serves to level the mower and constitutes a single point mount at the front and preferably providing for vertical adjustment.

Laterally spaced rear wheels **74** are operatively attached to the mower in a usual manner and, in operation, provide not only rolling support for the mower but also lateral stability for the bike when used in a mowing operation. A two spring attachment **76** is provided between the mini-bike frame and the mower construction which provides resiliency and a quickly disassociated or connectable attachment means for the mower assembly. The mower is can be attached to the bike and drive motor by means of a flexible coupling, hexagonal spline and centrifugal clutch, all generally designated or indicated at **78**, the details of which are not shown for clarity, but generally are of known constructions and details are not necessary to the concept of the invention. If used this could provide a flexibility and permits the blade to stop when the power is reduced or an impediment encountered by the blade. With the mower assembly attached to the mini-bike, operation of the transmission permits forward and reverse operation of the bike while preferably utilizing a low speed setting of the transmission.

The mower size and construction can vary with the mower size for example being between a 24 inch cut to a 48 inch cut as desired.

An additional contemplated use is for incorporation in the basic unit of a soil tiller in the nature of a roto tiller or the like generally indicated at **80**, FIGS. **5** and **6**. For attachment of the tiller, the front wheel assembly **16**, **18** is disconnected from and removed from the steering post **12**. The assembly **80** replaces the foregoing and includes a shaft **82** rotatably mounted in steering post **12** and which mounts a rotatable shaft **84** having secured thereto tiller cutting blades **86** of a usual type. The shaft **84** is carried by and within a housing **88**. The shaft **86** detachably mounts wheels **90** for moving the tiller about when not engaging in a tilling operation. A steering handle **92** is attached to housing **88** and permits steering and guiding of the mini-bike having the tiller attachment **80** mounted thereon. Drive of the tiller cutting blades **86** is accomplished through a drive including a pulley **94** of a type adapted for rotating the blades with pulley **94** being driven through a belt drive system generally designated **96** operatively engaged with a pulley **98** operatively associated with the output shaft of motor **22**. The connection of the tiller attachment can be easily and quickly accomplished in a readily understandable manner. The front wheel, fork and mower are removed and the tiller assembly as above described is attached to the frame and the drive belt system operatively engaged. Speed control and operation is basically as described hereinabove.

It will accordingly be seen that the unit of the present invention can be easily rearranged so that a standard or basic mini-bike construction can serve at least three different needs of desired use and substantially reduces initial cost and maintenance as compared with separate distinct units. The utilization of the mini-bike per se is in no way detracted from.

Manifestly minor changes in details of construction can be effected within the described embodiment within departing from the spirit and scope of the invention as defined in and limited solely by the appended claims.

I claim:

1. A multiple use mini-bike comprising, in combination:

A. a tandem two wheel minibike including:
   i. a frame;
   ii. a drive motor on said frame;
   iii. a controllable transmission operatively connected to said motor;
   iv. a rear traction wheel operatively driven from said transmission;

B. a detachable steering wheel assembly removably attachable to said frame;

C. a mower removably attachable to said frame and operatively driveable from said motor through said transmission; and

D. a steerable soil tiller removably attachable to said frame as a replacement for said steering assembly for soil tilling operations of said mini-bike and operatively driveable from said motor through said transmission.

2. A multiple use mini-bike as claimed in claim **1**, said tiller assembly including a mounting column adapted for replacement of a steering wheel mount on said frame, a shaft, tiller blades on said shaft, said latter shaft having a drive pulley operatively connected thereto and a drive pulley system interconnecting the tiller blade drive shaft and the motor output shaft.

3. A multiple use mini-bike as claimed in claim **2**, and including detachable wheels for said tiller for nontilling movement of the bike and a steering handle associated with the tiller.

4. A multiple use mini-bike as claimed in claim **1**, said transmission comprising a multi speed reversible transmission, and control means for said transmission.

5. A multiple use mini-bike as claimed in claim **4**, including mounting means for said mower, said mounting means including a longitudinally centrally positioned small front pivotable wheel adapted to level said mower, constituting a single point mount and being vertically adjustable, rear laterally spaced mount wheels for said mower assembly and laterally spaced spring attachments interconnecting said mower assembly and said frame, said rear wheels serving to laterally stabilize said mini-bike.

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