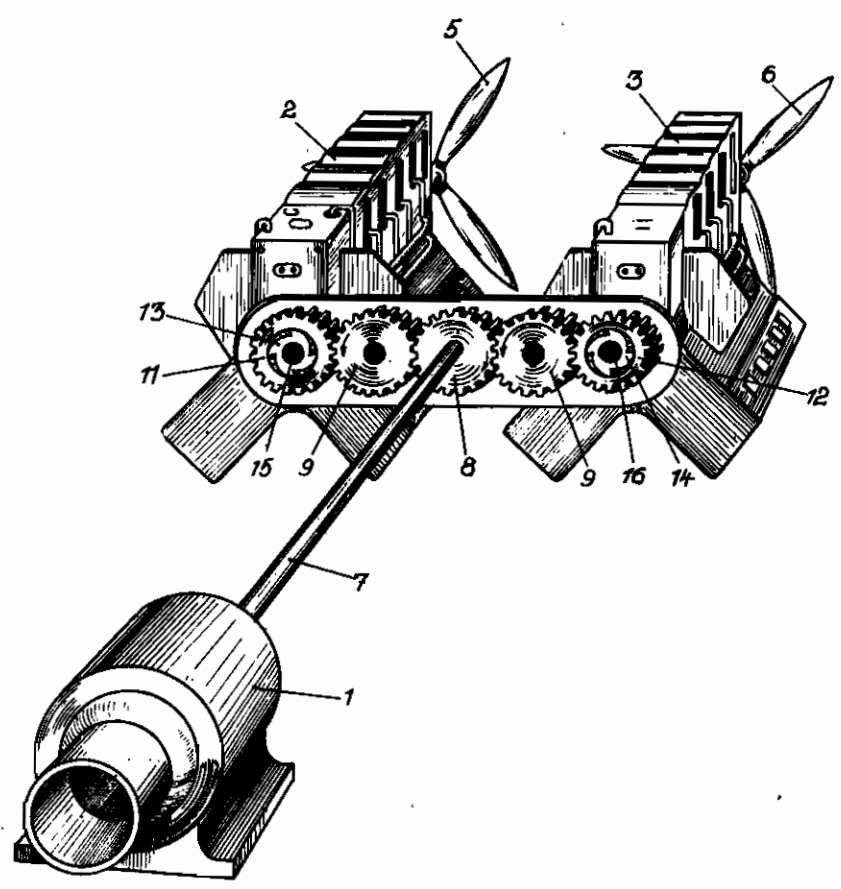


PUBLISHED
MAY 25, 1943.
BY A. P. C.

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DRIVING MEANS FOR AIR PUMPING
DEVICES ON AIRPLANES
Filed July 7, 1939

Serial No.
283,255



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ALIEN PROPERTY CUSTODIAN

DRIVING MEANS FOR AIR PUMPING DEVICES ON AIRPLANES

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Application filed July 7, 1939

This invention relates to driving means for air pumping devices or airplanes, and refers more particularly to driving means for pumping devices by which the suction and discharge of air from the skin layer is effected. By exhausting air from the skin layer greater lifting power can be developed which is particularly desirable for heavily loaded airplanes when starting or landing. Starting is always a critical operation, particularly with a heavy load, and it is therefore of prime importance that a dependable pumping means be provided which can be relied upon to furnish this increase in lifting capacity for use when needed. For reasons of safety it has hitherto been proposed to provide a separate pumping device driven by each motor of multi-motored airplanes, so that each device and motor may handle a part of the suction, but in such cases failure of one of the motors results in throwing the suction system out of balance and produces a very dangerous condition; another arrangement which has been employed consists in the provision of separate pumping devices operated by different motors and all connected to a common main, but then failure of one of the motors materially reduces the volume of air exhausted from the skin layer and thus materially lessens the effectiveness of the entire system.

It is an object of this invention to provide a driving means for an air pumping device on airplanes employed for the above named purpose which guarantees the continued operation of the pumping device at full capacity in the event of failure of one of the motors so that the increased lifting capacity thus generated may be depended upon when it is most needed; and wherein means are provided whereby the pumping device is driven jointly by the motors when they are in operation, and which will continue to function at the same capacity so long as one motor connected thereto is running.

Another object of the invention is to provide a driving means for an air pumping device on airplanes wherein an over-running clutch is provided on each motor shaft through which a drive, preferably through gearing, is imparted to the shaft of the pumping means. Thus I aim to provide a drive means which is automatic and

requires no attention or manipulation in the event of failure of one of the motors.

Yet another object of the invention is to provide a driving means for an air pumping device on airplanes wherein the parts connecting the drive shaft of the motor which has stopped will not interfere with the continued operation of the pumping means, neither will the stopped motor be driven thereby.

Having thus stated the major objects and advantages of the invention I will now proceed to describe it in detail with the aid of the drawing, in which a perspective view is shown of my driving means connected to two motors and the pumping device.

In the drawing, 1 designates an air pumping device having a drive shaft 7 on which a driving wheel, in this instance gear 8, is secured. 2 and 3 indicate two suitably spaced motors having conventional propellers 5 and 6 respectively. Provided upon extremities of the motor shafts 15 and 16 are over-running clutches 13 and 14 which are built into driving wheels 11 and 12 respectively, which are shown in the form of gears. Suitable means are provided for transmitting power from the drive wheels 11 and 12 to the gear 8, so that both the motors 2 and 3 drive the shaft 7 in the same direction. In the present instance this is accomplished by the use of one intermediate gear 9 interposed between each of the gears 11 and 12 and the gear 7.

Thus when both the motors 2 and 3 are in operation the pumping device 1 is driven jointly by both of them, but in the event of failure of one of the motors, say the motor 2, the pumping device is still driven by the motor 3 so that when employed for the above named purpose the same amount of additional lifting capacity is still available for the airplane. Upon failure of the motor 2 the gear 11 still continues to rotate but does not cause the rotation of the motor shaft 15 on account of the inclusion of the over-running clutch 13. When the motor 2 is not operating it does not in any way interfere with the operation of the pumping device 1 then being driven by the motor 3 through the clutch 14 and gear 12.

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