

Lining suspension

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Abstract: -- The paper finds that tilting trikes inherit leaning and dynamic stability characteristics from bicycles and the potential for static stability from trikes. Tilting removes the need for a trike to be wide and low to stay stable during cornering. This can make the trikes more visible and acceptable from a car driver's perspective compared to a standard, low recumbent trike.

High-end tilting trikes can have hybrid (human / electric) drives and meet the need for comfortable, sheltered vehicles capable of taking luggage on long commutes. These expensive high end filters are not widely available in Australia. Less complex filters can be better-than

INTRODUCTION

Transport needs to be sustainable not just from a noble "use resources sparingly" point of view, but also from a practical, personal perspective and increased use of cycles could help. All sorts of cycles could be in abundant use, and these include recumbent cycles, cargo bikes, vella mobiles and electric bikes. These comparatively new "improved cycles" include tilting trikes and can be "better-than-bicycle" with combinations of enhancements such as having extra power available, good aerodynamics, larger load capacity, extra stability when stopped, and added weather protect



There are many definitions associated with this topic and a glossary is included. The most common terms are Delta trike: a trike with 1 wheel at the front, Tadpole trike: A trike with 2 wheels at the front, NTV: Narrow Tilting Vehicle.

Leaning is synonymous with all two wheeled bicycles, but it is not standard on 3 or 4 wheel vehicles. So I describe tilting in an NTV as "the ability of a vehicle with apparent static stability (three or more non-collinear wheels) to lean into corners and keep all wheels on the ground"

LITERATURE SURVEY

In one aspect, the present provides a leaning vehicle having a frame having a front portion and a rear portion; a straddle seat supported on the frame; an engine supported by the frame; a shock tower having an upper end and a lower end, the lower end of the shock tower being pivotally connected to the front portion of the frame through a pivotal connection that defines a frame leaning axis about which the frame can lean to a right side and to a left side relative to the shock tower; a front left suspension assembly and a front right suspension assembly operatively connected to the front portion of the frame; a steering assembly having a steering column supported by the frame, the steering column being operatively connected to a handlebar to be grasped by a driver straddled on the straddle seat to steer the vehicle in a desired direction; and a rear suspension connected to the rear portion of the frame. Each front suspension assembly includes a lower suspension arm pivotally connected to the frame at a first end and pivotally connected to a ground engaging member at a second end; and a shock absorber having an upper end connected to the upper end of the shock tower and a lower end connected to the lower suspension arm. An actuated lock locks the frame to the shock tower and prevents relative movement between the frame and the shock tower about the frame leaning axis.

In an additional aspect, the actuated lock includes a locking pin adapted to engage a notch plate having at least one notch. The locking pin is mounted to at least one of the frame and the shock tower.

TILTING AND BALANCE.

Bikes require active balance to ride and are dynamically stable. In a straight line, the rider keeps the bike's centre of gravity above the line between the two wheels by small steering inputs. Superimposed on this is leaning, i.e. keeping balanced when cornering by countering an outward centrifugal force with an inward gravitational force. The force on bike wheels is always close to 90 degrees to the wheel axis (Karnop 2004, p. 147).

Non leaning trikes are statically stable. They will tip when cornering shifts their centre of gravity outside of the "stability wedge" defined by the space above their tyre contact points, but riders can forestall tipping by moving their centre of gravity, shifting body weight into the direction of a corner. Resultant forces on non-leaning trike wheels are not at 90 degrees to the wheel axis, and this increases the requirement for strength in trike wheels. For reasons of stability, non-tilting recumbent trikes are often low with a wide track, and their lack of height can make them hard to see in traffic.

PROJECT SPECIFICATION

A three wheeled vehicle comprising: **A right front steerable wheel and a left front steerable wheel disposed on respective sides of a central steering shaft having a handlebar attached thereto wherein each of said right and left front steerable wheels has respective turning pivot;** **A rear wheel positioned on a rear axle and disposed aft of and between said two front wheels;** **A rider seat disposed intermediate said rear axle and said steering shaft wherein said two front wheels including steering linkage disposed between their respective turning pivots and said central steering shaft;** **A front frame coupled to and supporting said two front wheels, said steering shaft, and steering linkage and said handlebar;** **A rear frame supporting a rider, said rear wheel, and a vehicle propulsion arrangement.** **A pivotable connection between said front frame and said rear frame.**

VEHICLE SPECIFICATIONS:

SR. NO.	PARTICULARS	SPECIFICATIONS
1	Vehicle Type	2-Wheel CVT Tadpole
2	Mechanical Dimensions L x W x H (mm)	1875 x 890 x 680
3	Leaning angle	36 degrees

ADVANTAGS:

It provides anti-skidding effect. **Bike can be used for on road as well as for off road purpose.** **Tilting provided is maximum up to 36 degrees.** **Assembly is reliable.** **Bolt on assembly gives redundancy to use vehicle as per requirement.** **Rider is safe while taking sharp turn on the road cause possibility of skidding or falling of bike is almost negligible.** **Normal people can take experience of off road biking.** **Wet road driving with tadpole is easier than two wheel arrangement.**

DISADVANTAGES

Whole weight of the vehicle increase s. **Fuel consumption increases.** **Stand of the bike is of no use because bike stands easily on three wheels.** **Weight shifting while turning is required.** **Slight misalignment can cause huge Permissions are necessary in some reasons.**

APPLICATION

1. Off Road Driving.
2. Can be suited for Handicapped People.
3. Can be used in rainy season.

CONCLUSION

We have successfully achieved leaning of wheels up to 36 degrees along with reasonably good performance of trike on road as well as off road. The vehicle cornering ability is well tested and gave response as we desired

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