

Explaining cam and its followers health and social care essay

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“ A Cam is a mechanical constituent of a machine that is used to convey gesture to another constituent, called the follower, through a prescribed gesture plan by direct contact. ”

Introduction

A Cam follower, besides known as a path follower, is a specialised type of roller or needle bearing designed to follow Cams. Cam followings come in a huge array of different constellations, nevertheless the most defining feature is how the Cam follower saddle horses to its copulating portion ; stud manner Cam followings use a he-man while the yoke manner has a hole through the center.

The first Cam follower was invented and patented in 1937 by Thomas L. Robinson of the McGill Manufacturing Company. [3] It replaced utilizing merely a standard bearing and bolt. The new Cam followings were easier to utilize because the he-man was already included and they could besides manage higher tonss. [

A Cam mechanism consists of three elements: the Cam, the follower (or follower system) , and the frame. The follower is in direct contact with the Cam. The Cam may be of assorted forms. The follower system includes all of the elements to which gesture is imparted by the Cam. This may be connected straight to the follower, or connected through linkages and pitching. The frame of the machine supports the bearing surfaces for the Cam and for the follower.

A CAM changes the input gesture, which is normally rotary gesture (a revolving gesture) , to a reciprocating gesture of the follower. They are found in many machines and playthings

What is the concept behind cam?

A CAM is a revolving machine component which gives reciprocating or hovering gesture to another component known as follower. The Cam and follower has a point or line contact represent a higher brace or you can state that it is the mechanical constituent of a machine that is used to convey the gesture to the another constituent of the machine called the follower, through a prescribed plan by direct contact. The contact between them is maintained by an external force which is by and large provided by the spring or sometimes by the weight of the follower itself, when it is sufficient. Cam is the driver member and the follower is the goaded member. The follower is in direct contact with the Cam.

Cam: It may be of many forms

Follower: It includes all the elements to which gesture is imparted by the cam. This may be connected straight by the cam. This may be connected straight to the follower, or connected through linkages and geartrain.

Frame: The frame of the machine supports the bearing surfaces for the Cam and for the follower.

Cam and follower are widely used for runing recess and exhaust valve of I C engine.

These are used in wall clock.

These are used in provender mechanism of automatic lathe Machine.

These are used in paper film editing machine.

Used in weaving fabric machineries.

The Cam mechanism is a various 1. It can be designed to bring forth about limitless types of gesticulating the follower.

It is used to transform a rotary gesture into a translating or hovering gesture.

On certain occasions, it is besides used to transform one translating or hovering gesture into a different translating or hovering gesture.

River cams are used in a broad assortment of automatic machines and instruments.

The certain usages of Cam and followings that includes fabric machineries, computing machines, publishing imperativenesss, nutrient processing machines, internal burning engines, and countless other automatic machines, control systems and devices. The Cam mechanism is so a really of import constituent in modern mechanisation.

Categorization OF CAMS

Based on the physical form

Disk or home base Cams

Working of the phonograph record Cam with reciprocating follower.

Working of the phonograph record Cam with hovering follower.

Cylindrical Cam

Translating Cam

Categorization OF FOLLOWERS

- Based on surface in contact
- Knife border follower
- Roller follower
- Flat faced follower
- Spherical follower
- Based on type of gesture
- Hovering follow
- Translating follower
- Based on line of action
- Radial (in line) follower
- Off-set follower

River cams can be handily classified into two chief groups

Group a: River cams that impart gesture to the follower in a plane in line with the axis of rotary motion of the Cam (as does a cylindrical Cam) .

Group B: River cams that impart gesture to the follower in a plane at 90 grades to the axis of rotary motion, as with face or border cams. Most cams autumn into this class.

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TYPES OF CAMS

Bizarre Cam:

A round Cam is frequently called an bizarre Cam because the axis of rotary motion of the Cam is offset from the geometric centre of the round phonograph record.

Concentric phonograph record:

A homocentric phonograph record attached to a rotating shaft would hold its axis of rotary motion co-occurring with its geometric centre.

PROFILE SHAPES OF SOME CAMS:

Pear-shaped Cam:

These type Cams are frequently used for commanding valves. For illustration, they are used on motor auto camshafts to run the engine valves.

A

follower controlled by a pear-shaped Cam remains inactive for about half a revolution of the Cam. During the clip that the follower is stationary, the Cam is in a dwell period. During the other half revolution of the Cam, the follower rises and so falls. As the pearshaped Cam is symmetrical, the rise gesture is the same as the autumn gesture.

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Edge Cams

It must be appreciated that this type of Cam, where the follower is in contact with the border of the Cam phonograph record, is merely capable of leaving positive gesture to its follower in one way, that is, during the rise part of the cam motion. During the autumn part of the Cam motion the follower must be maintained in contact with the Cam either by the mass of the follower and its mechanism or, more normally, by a spring. Both methods have their advantages.

Box Cams

A channel can be milled in the face of cam phonograph record. As the Cam rotates, a follower located in the channel has its gesture guided by the channel. This type of Cam is called a box Cam.

Cylindrical Cams:

Cylindrical Cams are used when gesture has to be transmitted parallel to the axis of rotary motion of the Cam. The cylindrical or barrel Cam consists of a revolving cylinder with a coiling (sleep together shaped) channel in its curved surface. A follower with a tapering roller terminal is located in the channel. As the cylinder turns, the follower moves in a consecutive line analogue to the axis of the rotary motion barrel Cam.

This type of Cam is frequently used to steer yarn on run uping machines, looms and fabric doing machines.

Round Cam:

These Cams are sometimes called bizarre Cam. The Cam profile is a circle. The centre of rotary motion of the Cam is frequently from the geometric centre of the circle. The round Cam produces a smooth signifier of gesture called a simple harmonic gesture. These Cams are frequently used to bring forth gesture in pumps. Round Cams are frequently used to run steam engine valves. As the Cam is symmetrical, the rise and autumn gestures are the same.

HEART SHAPED CAMS:

This Cam causes the follower to travel with a unvarying speed. Cordate Cams are indispensable when the follower gesture demands to be unvarying or steady as, for illustration, in the mechanism that winds thread equally on the spool of a sewing machine. A cordate Cam can be used for weaving wire equally on the former of a solenoid.

UNIFORM ACCELERATION AND RETARDATION CAMS:

A Cam shaped as shown controls the gesture of the follower so that it moves with unvarying acceleration and deceleration. The follower additions and loses speed at a changeless rate. Uniform acceleration and deceleration Cams are used to command the gesture of linkages in complex machinery.

Types of Cam Followers

There are three types of Cam followings, and since the type of follower influences the profile of the Cam it is worthwhile sing the advantages and

disadvantages of each type. The three types are the knife-edge, the roller follower and the patrolman or mushroom follower.

The Knife Edge Follower:

This is the simplest type, is non frequently used due to the rapid rate of wear. When it is adopted, it is normally for reciprocating gesture, running in slides and there is considerable side push, this being a constituent of the push from the Cam.

The Roller Follower:

This eliminates the job of rapid wear since the skidding consequence is mostly replaced by a roller action. Some sliding will still take topographic point due to the changing peripheral velocity of the Cam profile, due to the altering radius of the point of contact. Note besides that the radial place of the contact between the Cam and the roller, comparative to the follower centre, will alter harmonizing to whether a rise or autumn gesture is taken topographic point: this fact has to be considered when building the Cam profile. Again, with the roller follower, considerable side pushes are present, a disadvantage when covering with reciprocating gestures. This side push will be increased when utilizing little rollers.

The Flat Foot or Mushroom Follower:

This has the advantage that the lone side push nowadays is that due to the clash between the follower and the Cam. The job of wear is non so great as with the knife-edge follower, since the point of contact between the Cam and

follower will travel across the face of the follower harmonizing to the alteration of form of the Cam. A fast one to decrease farther the consequence of wear is to plan the

follower to be capable of axial rotary motion and set up the axis of the follower to lie to one side of the Cam. Thus the contact with the Cam will be given to do rotary motion of the follower. The Cam profile, to work with a patrolman follower, must be convex at all parts, in order to forestall the corners of the follower delving into the Cam profile. The minimal Cam radius should be every bit little as possible to minimise sliding speed and clash.

All three types of Cam followings can be mounted

in the undermentioned ways:

1. on-line with the Cam centre line,
2. Offset from the Cam centre line, or
3. Mounted on a singing radial arm.

Trace point:

A theoretical point on the follower, matching to the point of a fabricated knife-edge follower. It is used to bring forth the pitch curve. In the instance of a roller follower, the hint point is at the centre of the roller.

Pitch curve:

The way generated by the hint point at the follower is rotated about a stationary Cam.

Working curve:

The working surface of a Cam in contact with the follower. For the knife-edge follower of the home base Cam, the pitch curve and the working curves coincide. In a stopping point or grooved Cam there is an interior profile and an outer working curve.

Flip circle:

A circle from the Cam centre through the pitch point. The pitch circle radius is used to cipher a Cam of minimal size for a given force per unit area angle.

Prime circle (cite circle) :

The smallest circle from the Cam centre through the pitch curve.

Base circle:

The smallest circle from the Cam centre through the Cam profile curve.

Stroke or throw: The greatest distance or angle through which the follower moves or rotates.

Follower supplanting:

The place of the follower from a particular nothing or rest place (normally its the place when the follower contacts with the basal circle of the Cam) in relation to clip or the rotary angle of the Cam.

Pressure angle:

The angle at any point between the normal to the pitch curve and the instantaneous way of the follower gesture. This angle is of import in cam design because it represents the abruptness of the Cam profile.

Some inquiry arises sing Cams and followings:

When is a level faced follower preferred as compared to roller followings and why?

Flat faced followings are preferred to roller followings where infinite is limited for eg: Cams with level followings are used to run valves of an car engine but in instance of stationary and oil engines, roller followings are preferred because more infinite is available.

What information is plotted on displacement diagram of Cam and follower gesture?

Autonomic nervous system: Plot of additive supplanting i. e. lift or shot (s) of follower (on Y axis way) versus angular supplanting (l?) of the Cam for one rotary motion (on Ten axis way)