



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF AUTOMOBILE ENGINEERING

19AUT203 – Mechanics of Automobile Systems

II YEAR / IV SEM

Unit - 3 - Cams



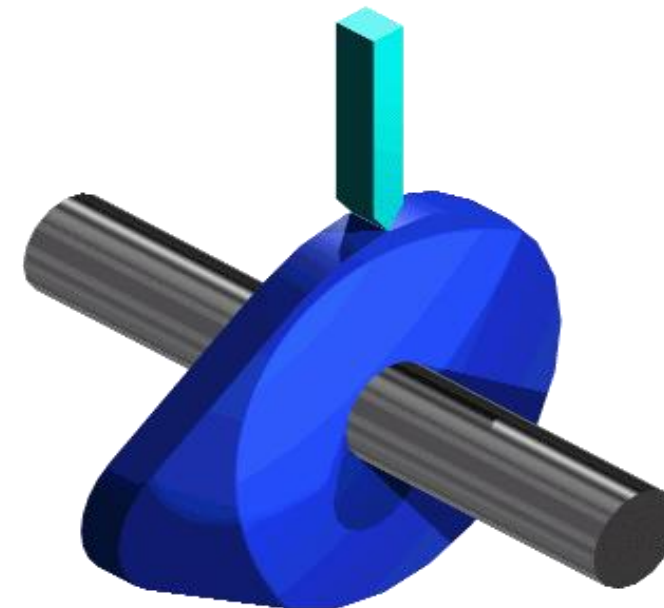
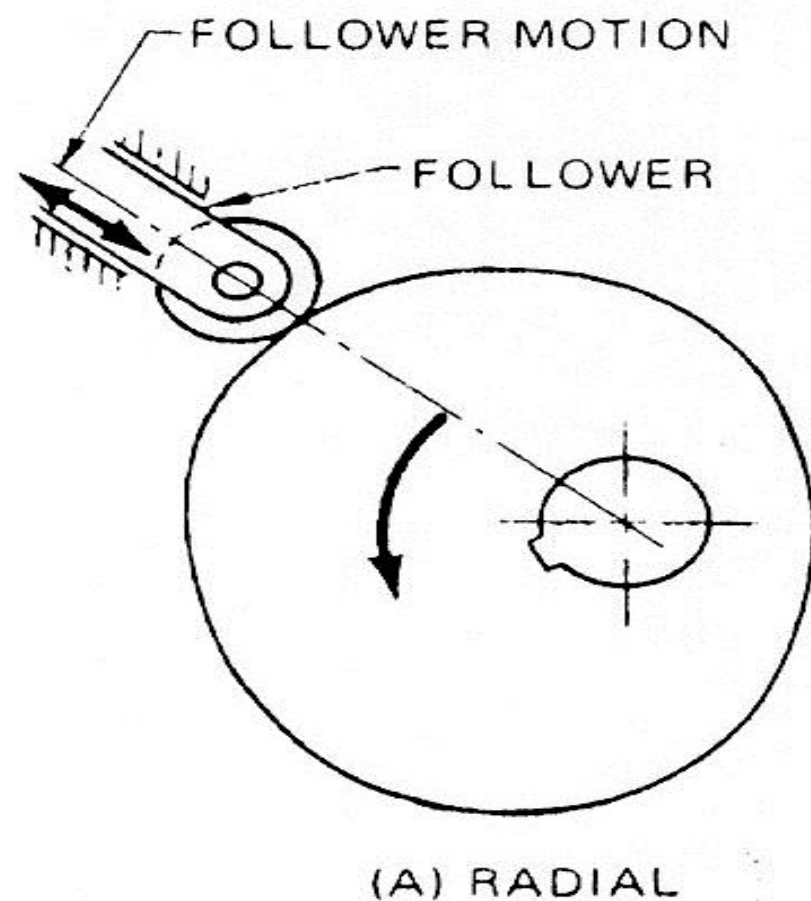
Cam



Cam - A mechanical device used to transmit motion to a follower by direct contact.

Cam - driver; Follower - driven

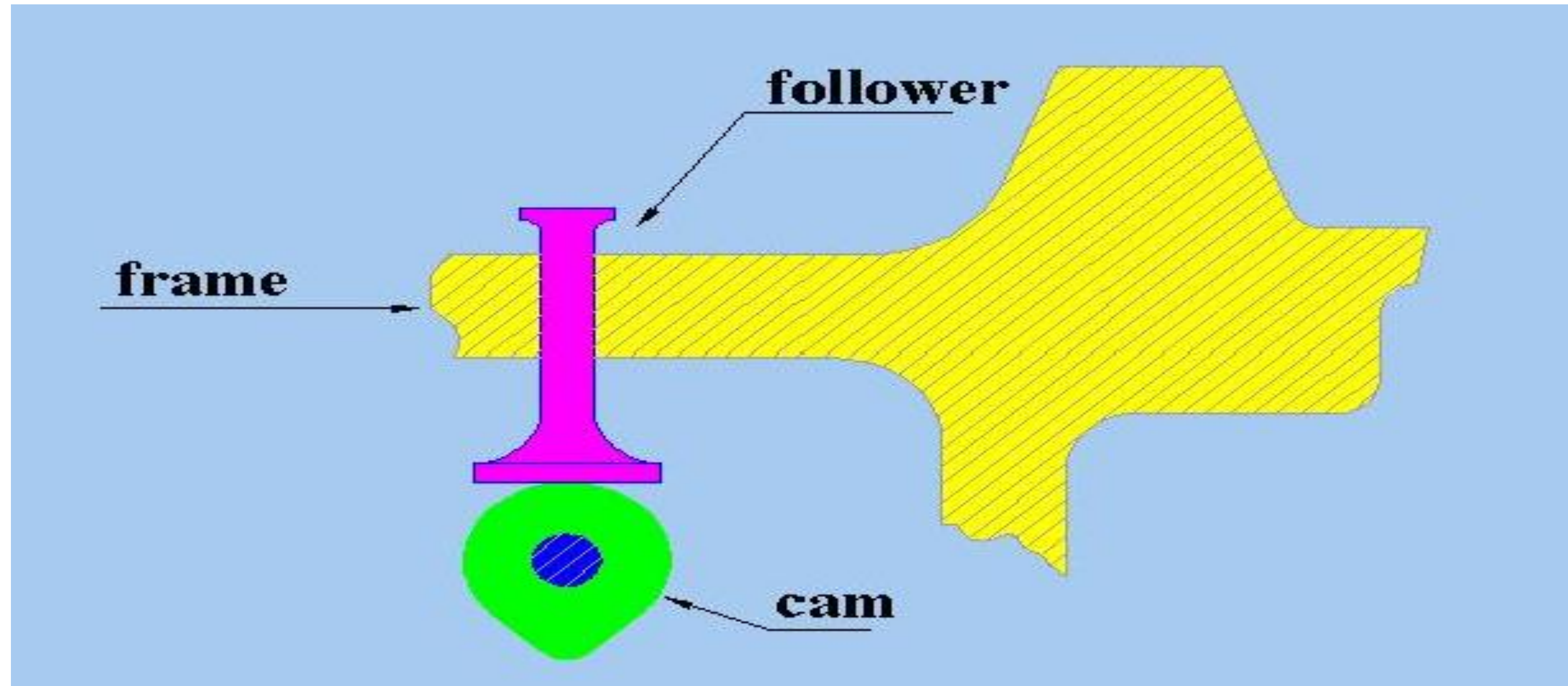
In a cam - follower pair, the cam normally rotates while the follower may translate or oscillate.

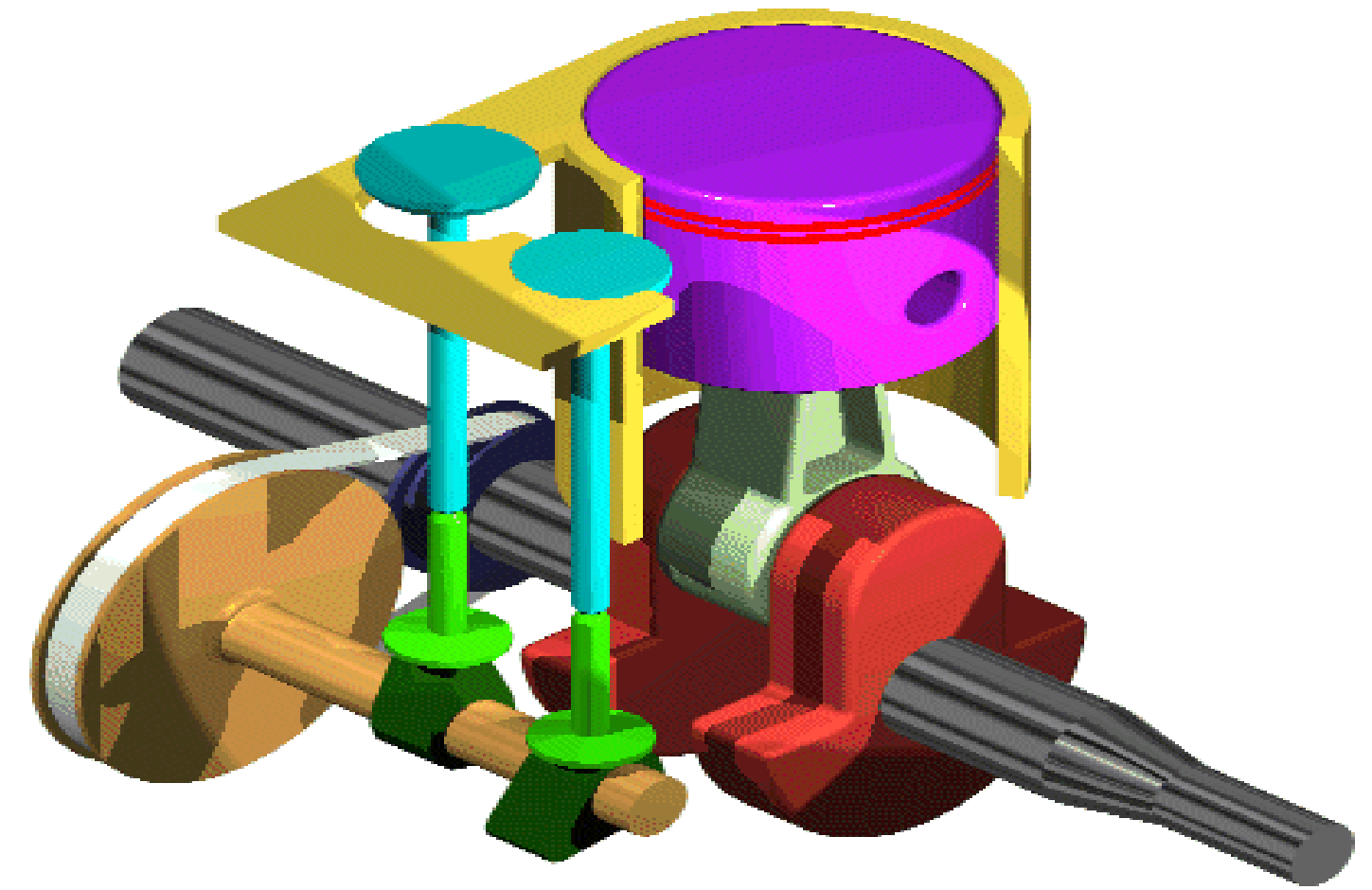
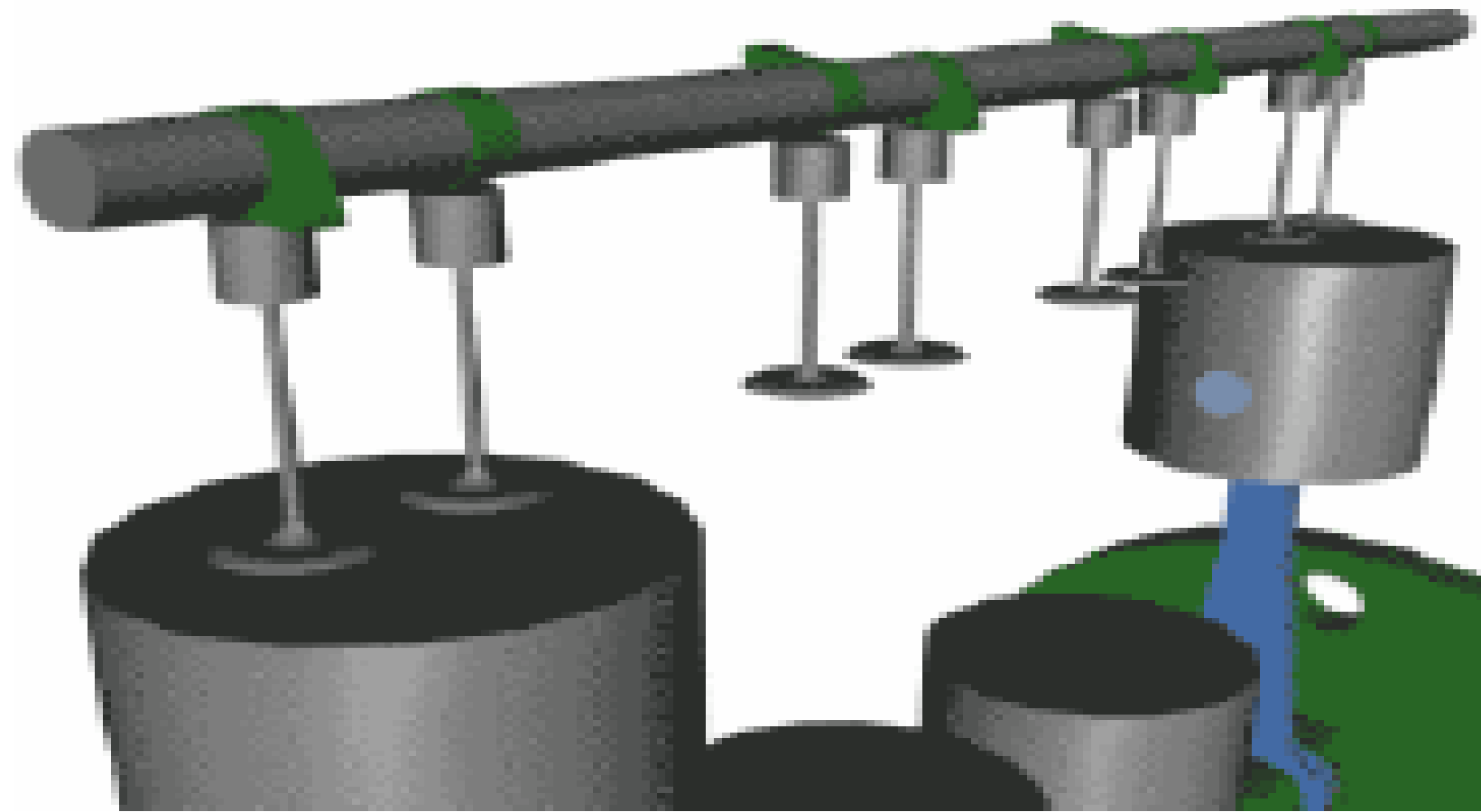


Cams are used to convert rotary motion into reciprocating motion



Three elements of the cam





Engine Valve Timing Control

In IC engines to operate the inlet and exhaust valves



Follower motions having almost any desired characteristics are not difficult to design.

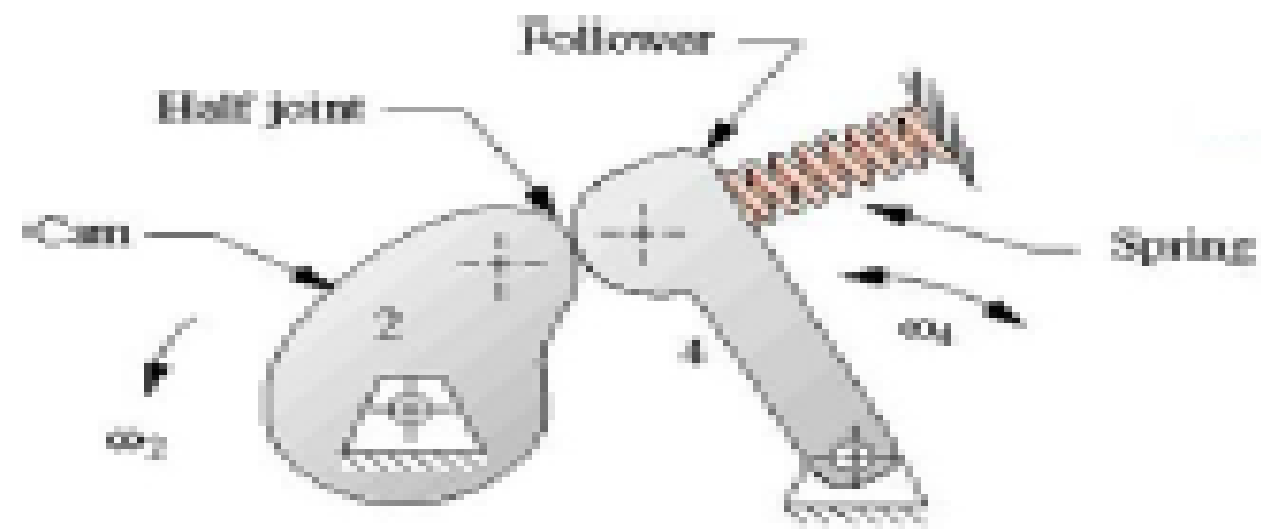
By desired characteristics are typically meant the following: **Displacement** – the height or distance through which the follower is moved for one revolution of the cam;

Velocity – the speed with which the cam moves the follower; **Acceleration** – the rate of change of velocity of the follower

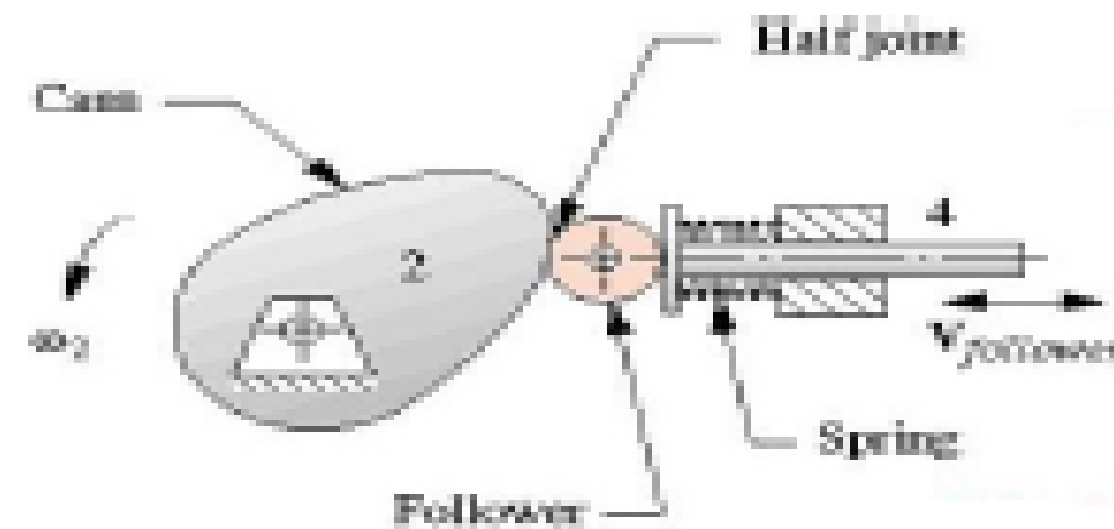
Jerk – the rate of change of acceleration.



Follower Motion



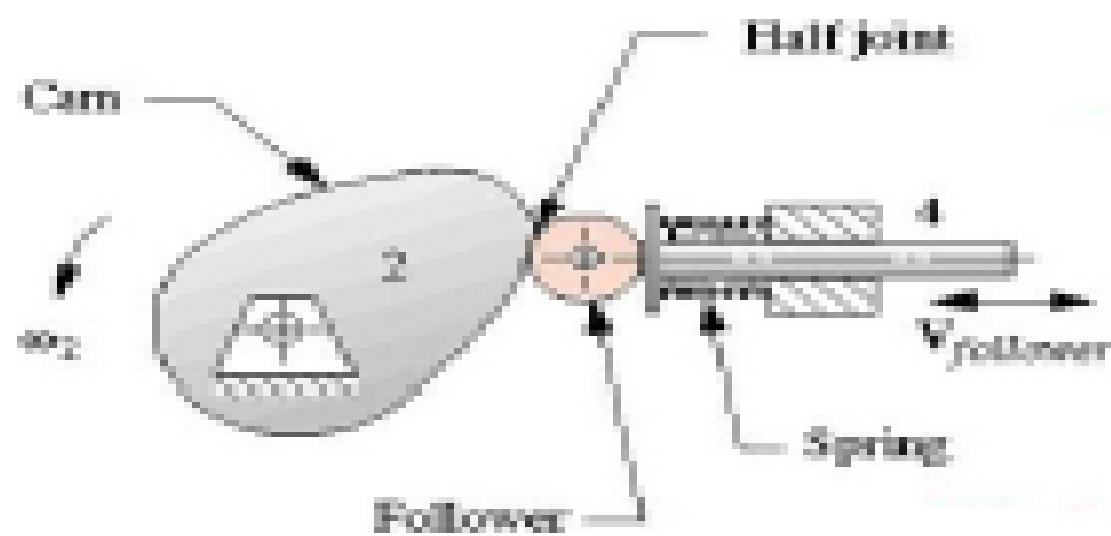
Rotating follower (analogous to crank-rocker linkage)



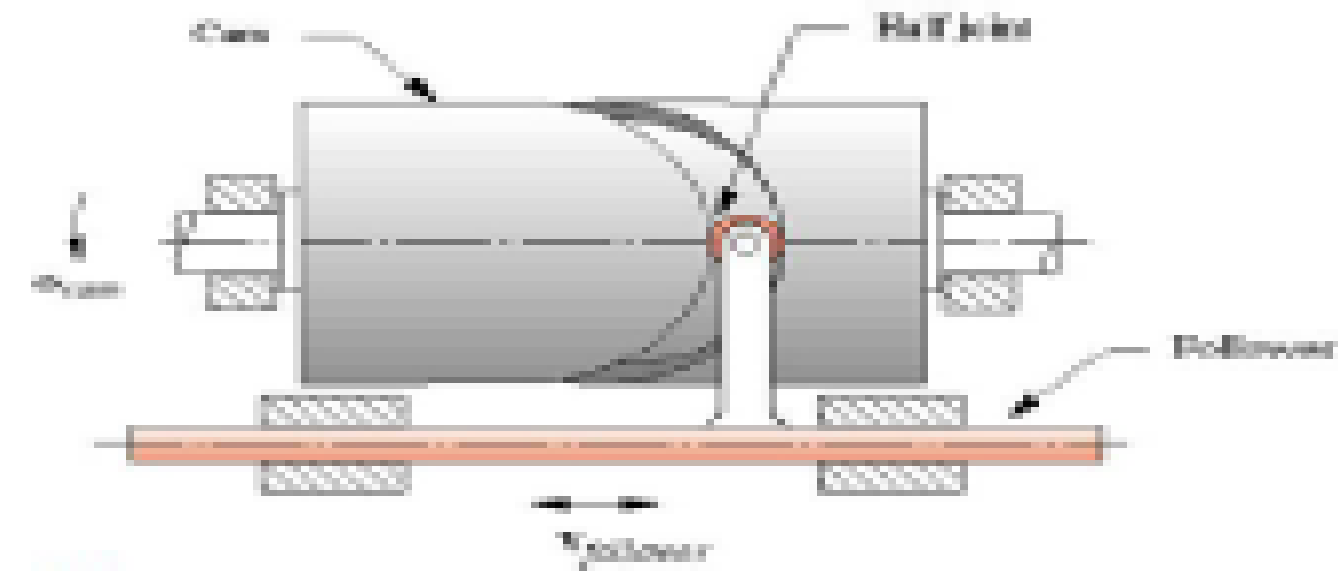
Translating follower (analogous to slider-crank linkage)



Cam Type



Radial cam (follower motion in radial direction of cam)

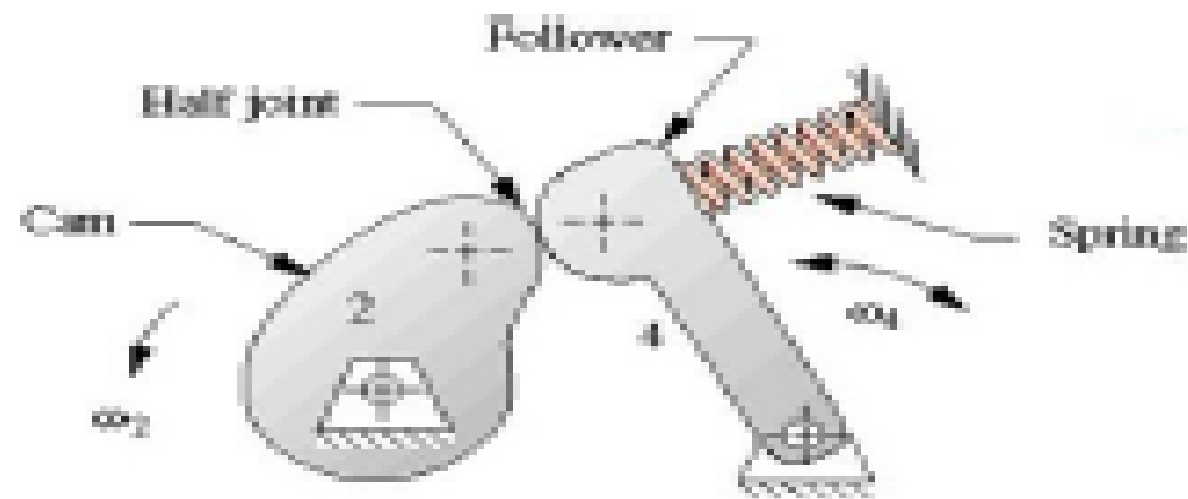


Axial cam (follower motion in axial direction of cam)

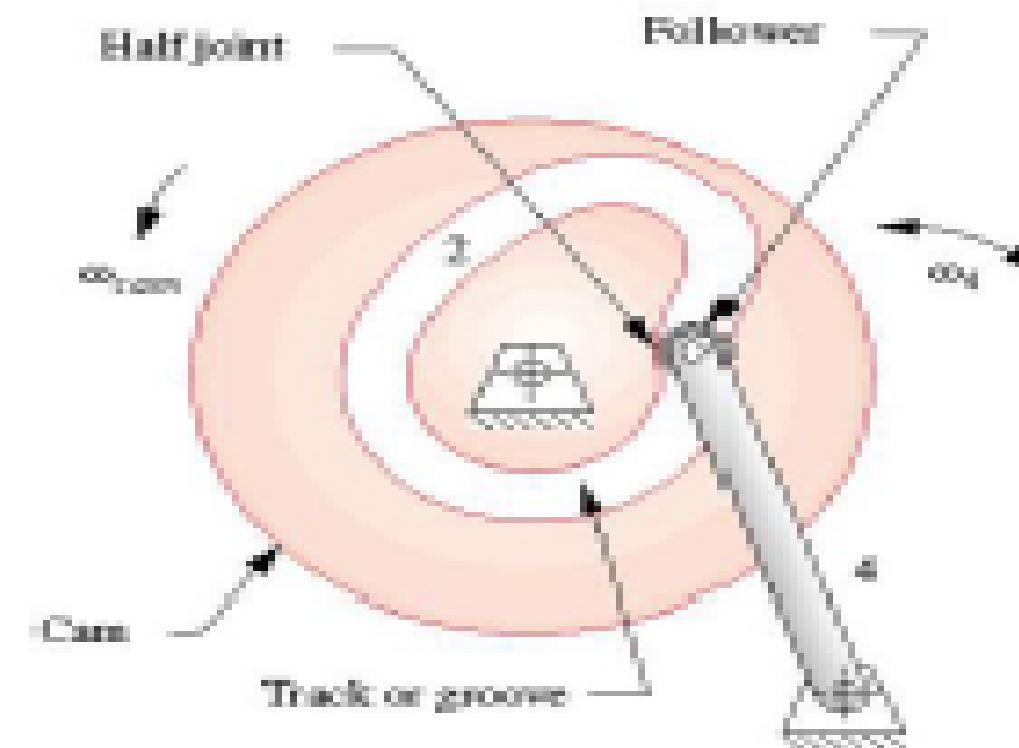


Type of Joint Closure

How to keep cam and follower always in contact?



Force closure: Use force, usually through a spring



Form closure: Use geometry, usually through a track/groove

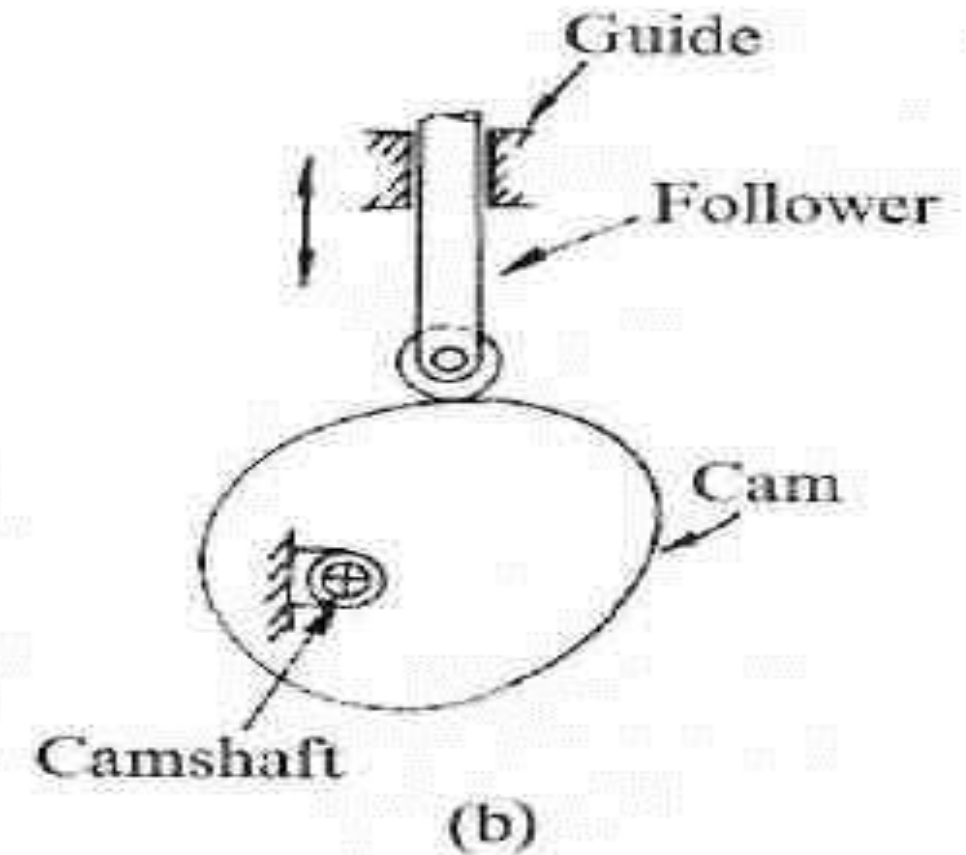
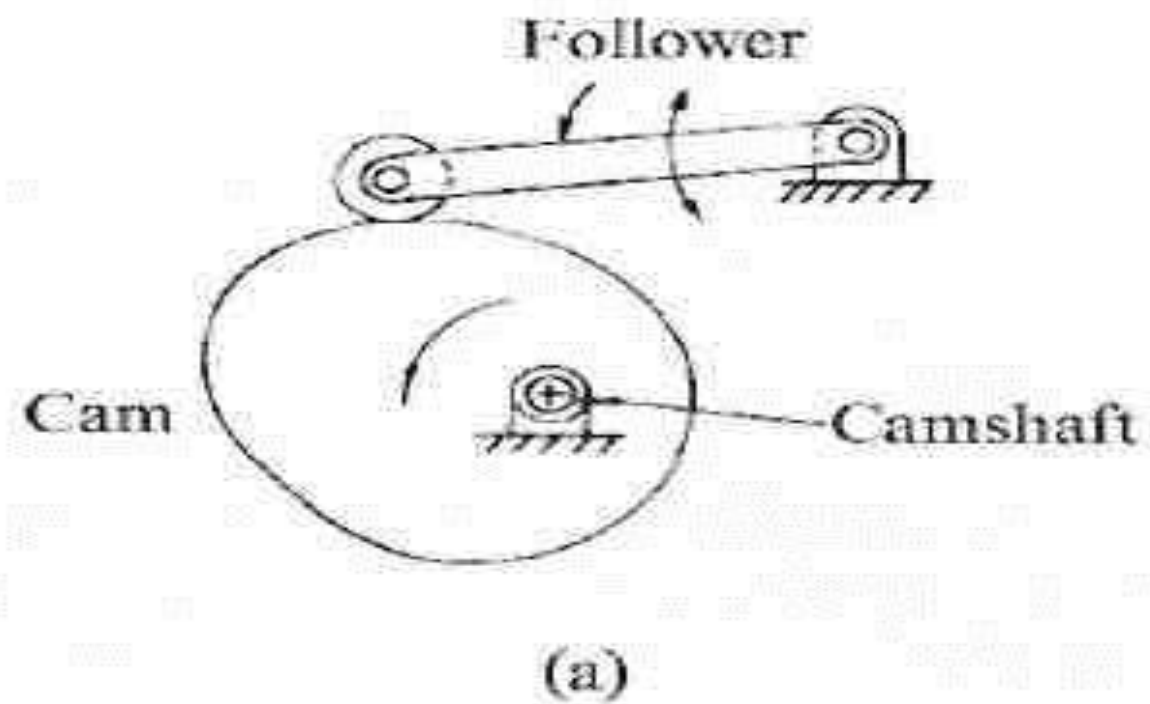


CLASSIFICATION OF CAMS



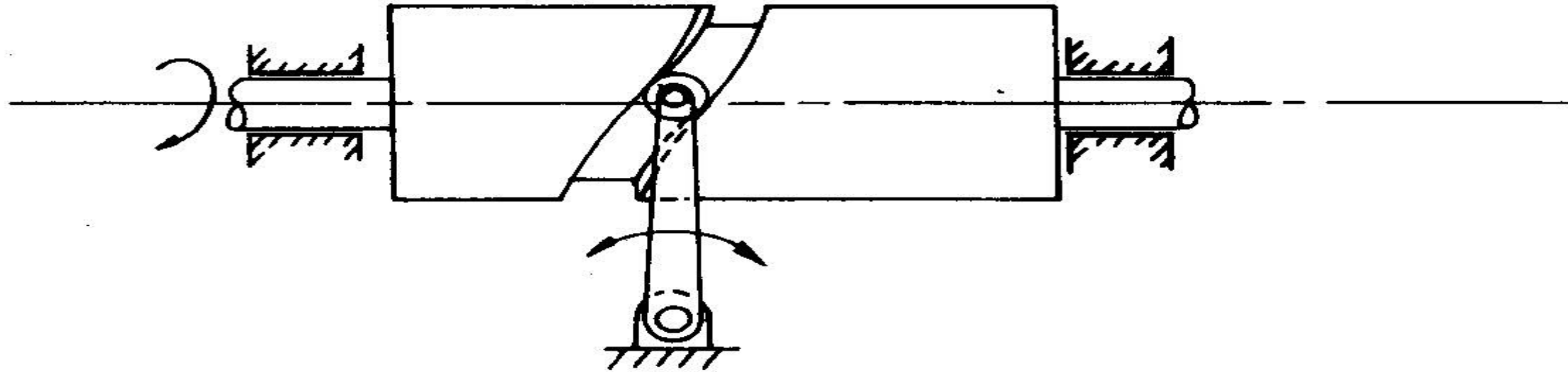
(i) Based on the physical shape

(a) Disk or plate cams



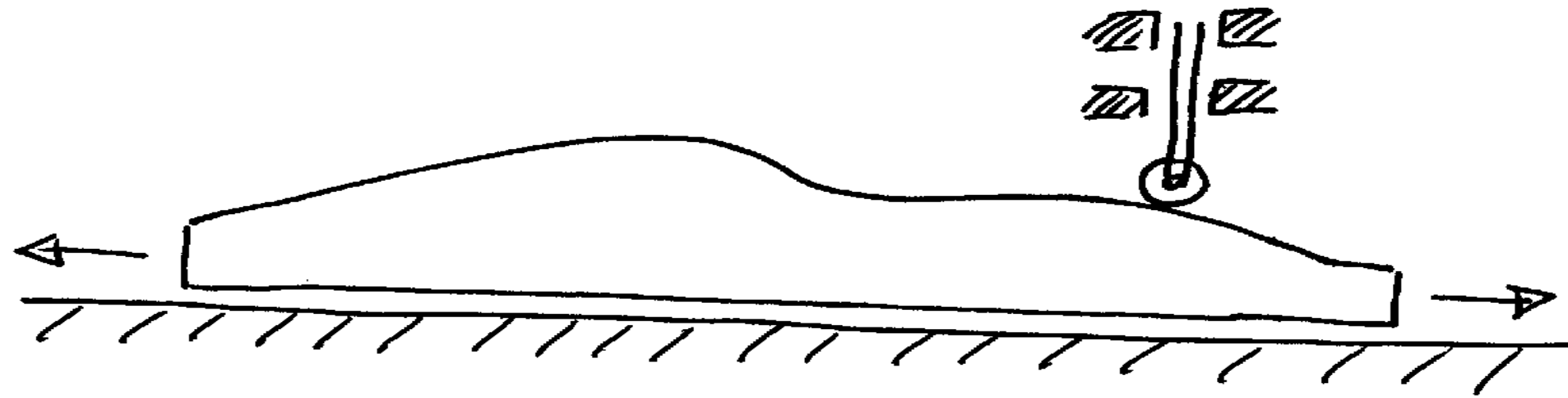


(b) Cylindrical cam



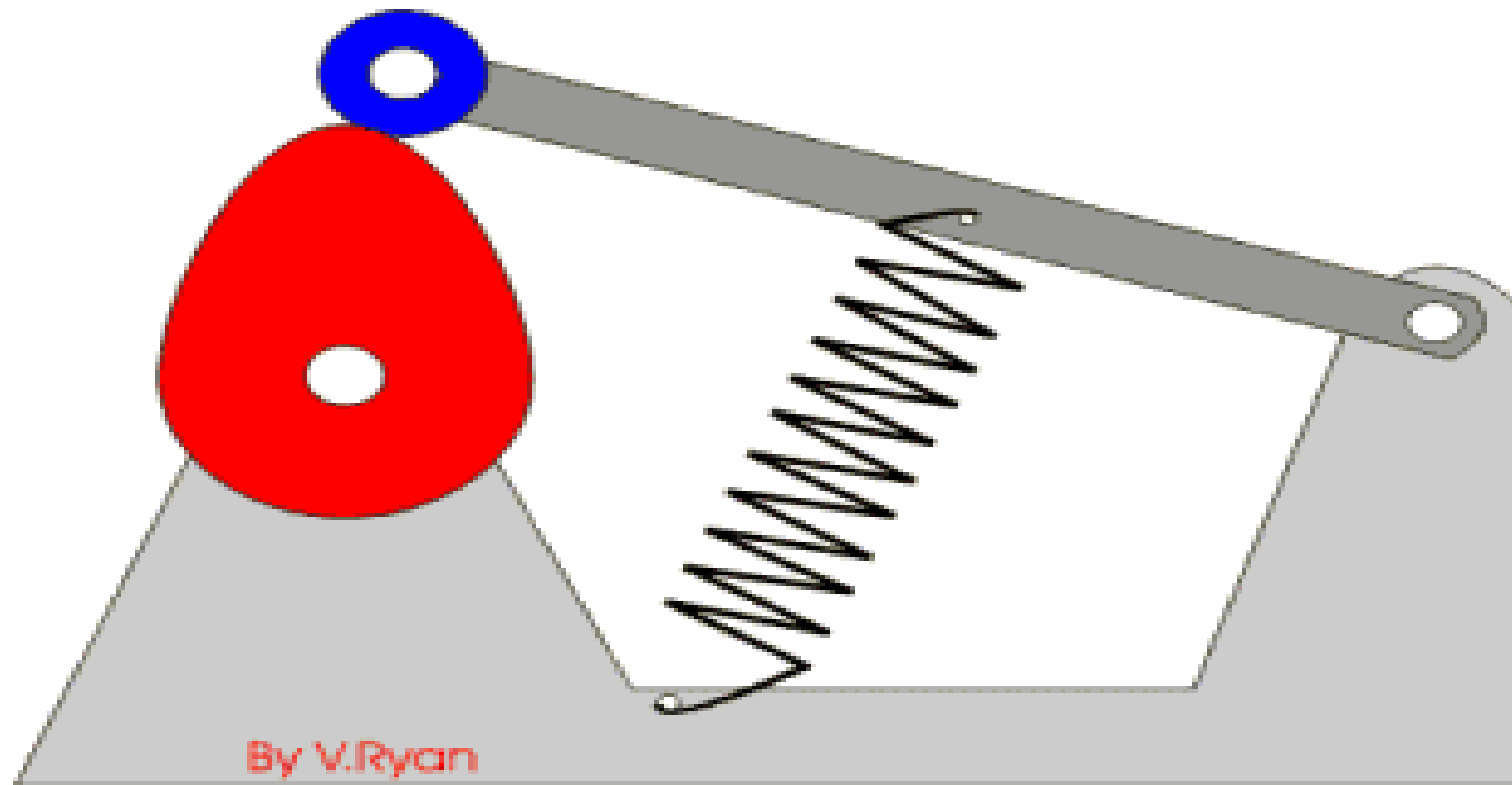


- **Translation Cam (Wedge Cam)**
- Not very commonly used. The cam moves over and back, reciprocating motion, which drives the follower vertically.



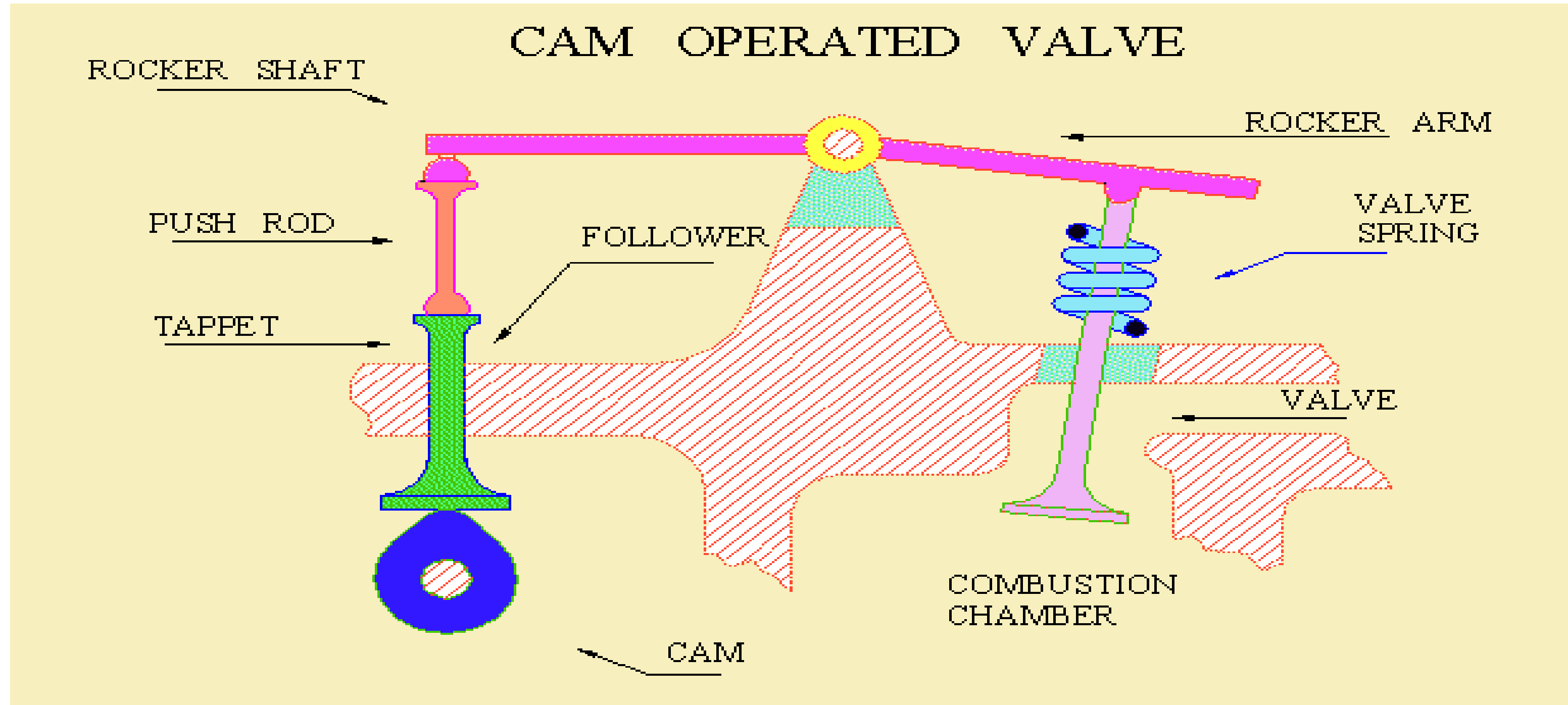


Example of cam action





Cam-Valve



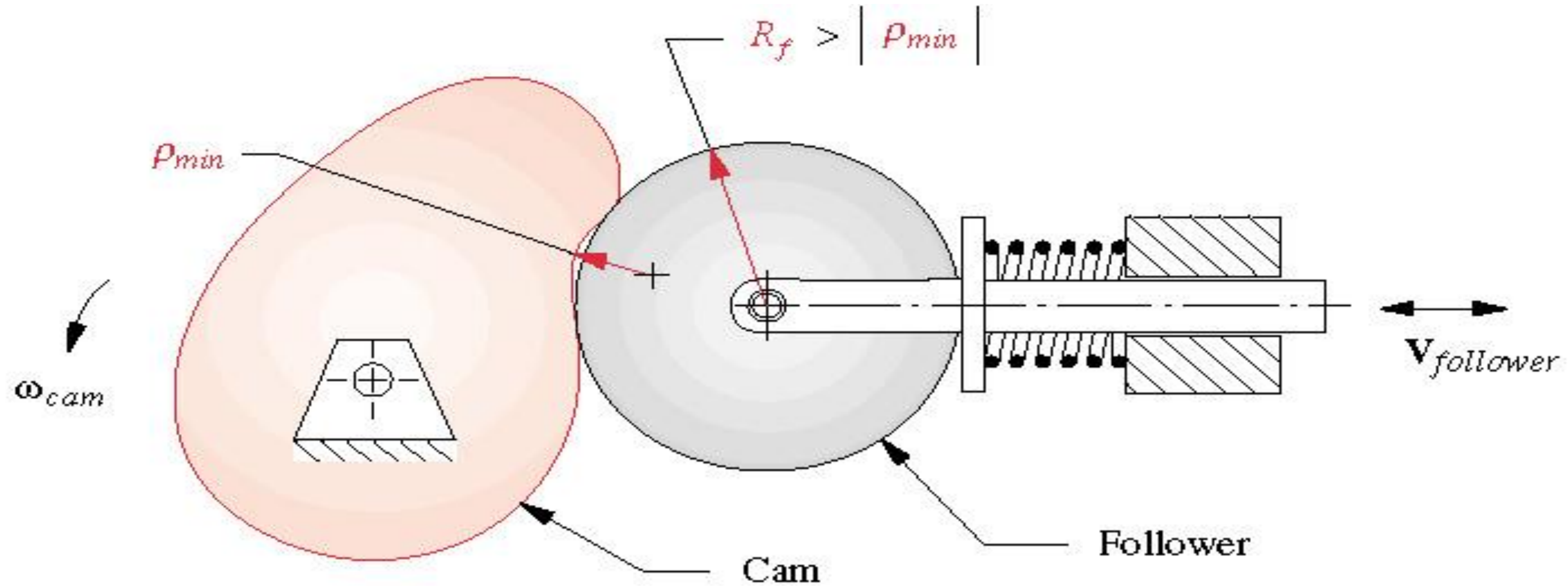
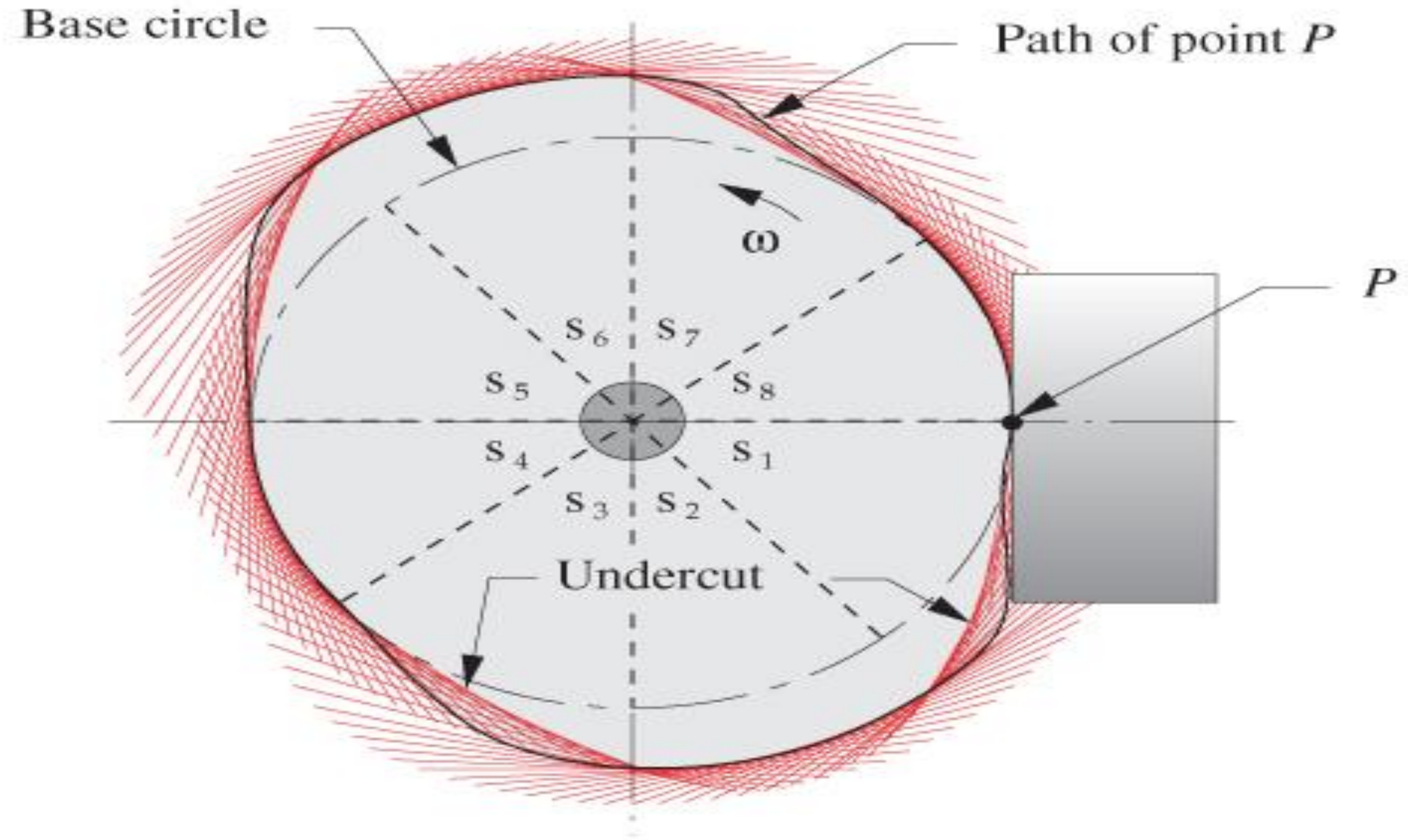


FIGURE 8-48

The result of using a roller follower larger than the one for which the cam was designed



Lift = 1
Rprime = 4
Eccen = 0
PaMin = 0
PaMax = 0
RcMin+ = 0.03
RcMin- = -0.16
Rfollwr = Infinite



Undercutting due to negative radius of curvature used with flat-faced follower



Thank You