Re: Propellantless propulsion fun 3 (recirculative propelant)

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- *From*: "Greg Neill" <gneillREM@xxxxxxxxxxxxxxx>
- *Date*: Tue, 22 Jul 2008 14:44:10 −0400

"Spaceman" <spaceman@xxxxxxxxxxxxxxxxxxxxxxxxxx> wrote in message news:V4SdnXYlgIAfgBvVnZ2dnUVZ_trinZ2d@xxxxxxxxxxx

> Greg Neill wrote:
>
>> "Spaceman" <spaceman@xxxxxxxxxxxxxxxxxxxxxxxxxx> wrote in message
>> news:7padnbhwn6puiBvVnZ2dnUVZ_szinZ2d@xxxxxxxxxxx
>>
>>> Greg Neill wrote:
>>>
>>>> Sorry, I don't get your point. KE is simply (1/2)*m*v^2
>>>> where m is whatever mass is involved. What is
>>>> calculating the kinetic energy going to accomplish
>>>> here?
>>>
>>> It is going to show you that it will take more
>>> kinetic energy to stop the larger mass then it
>>> took to "move" the larger mass.
>>
>> Since kinetic energy isn't conserved, it would not
>> surprise me. In fact, you could employ nearly any
>> amount of kinetic energy you wish to stop the
>> larger mass.
>>
>> How? Well kinetic energy is proportional to the
>> mass and the square of the velocity. Say that your
>> mass in motion is M travelling at velocity V. You
>> want to bring it to a halt, but you want to use
>> more kinetic energy than M has to do it. So you
>> fire a smaller mass at it with a much higher
>> velocity.

Say we choose a mass m = M/10.

In order to bring the mass to a halt the smaller mass m travelling at velocity v must be carrying exactly the same momentum as the larger mass M. So

M*V = m*v

v = V*M/m

but m = M/10 so

v = V*10

We fire the smaller mass at ten times the velocity as the larger mass is travelling. That gives it a kinetic energy of

KE = (1/2)*m*v^2

= (1/2)*(M/10)*(V*10)^2

= 10*(1/2)*M*V^2

It's kinetic energy is ten times that of the mass M.

> Anyways, if you want the kinetic energy of
> the launched
> ball it's (1/2)*m*v^2. If you want the kinetic
> energy
> of the ball and object after impact it's
>
> (1/2)*(M + m)*v2^2
> = (1/2)*(M + m)*[v*m/(M + m)]^2
> = (1/2)*m^2*v^2*/(M + m)
>
> So it's smaller than the kinetic energy of the
> ball alone
> was by a factor of m/(M + m). Again, kinetic
> energy is
> *not* a conserved quantity in general.

So now you think the ball getting stuck in the large mass will violate the conservation of energy.

> > Nope. Kinetic energy is not conserved. It trades off
> > with other forms of energy to keep the sum total conserved
> > (liek it does with potential energy in orbits) but kinetic
> > energy by itslef is *not* a conserved quantity.

> And you typed all that shit and still can not grasp
> That the same amount of force to move the larger
> object, will not stop the larger object once in motion because the
> larger object now has a greater KE than it had when
> it was "at rest".

That's an absurd contention. Kinetic energy is
frame dependent.

Suppose you have an observer at rest with respect to
a mass M. In his frame of reference he applies a
force F to the mass M for period of t seconds. That
is, he causes the mass to accelerate with an
acceleration of a = F/M for a time duration of t.

At the end of that one second the mass is travelling
at a speed v = a*t = F/M*t.

Now, a second observer happens to have been coasting
by when this happend. By coincidence he happend to
be travelling along at the speed v with respect to
the first observer, so what he sees from his point
of view is the mass M starting off with a velocity
of −v in his frame, shoved by the other observer
(decellerated) and coming to rest in his frame.

So both observers witnessed a change of velocity of
magnitude v for the same mass M using the same force
F for the same length of time t. One saw the mass
accelerate to speed v, the other saw it decelerate
from speed v to rest in his frame.

The situations are entirely symmetrical. You can
reverse the roles of the observers, starting with
the mass at rest in the second observer's frame
and him shoving it to cause it to come to rest in
first's frame. In each case the same force F is
applied for time t.

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